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Statische Berechnung

Aluminium Allwetterbelag, H = 13 mm

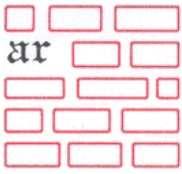
BAUHERR AVA-Innovation
Allmendstraße 7
77948 Friesenheim

PROJEKT Aludielen13

AZ 19259_1

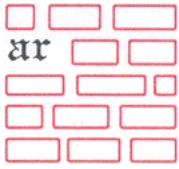
Aluminium Allwetterbelag.

Die Berechnung betrachtet die Aludielen in 1m Breite verlegt.
Berechnet wird das Element als Terrassen- bzw Balkonbelag.



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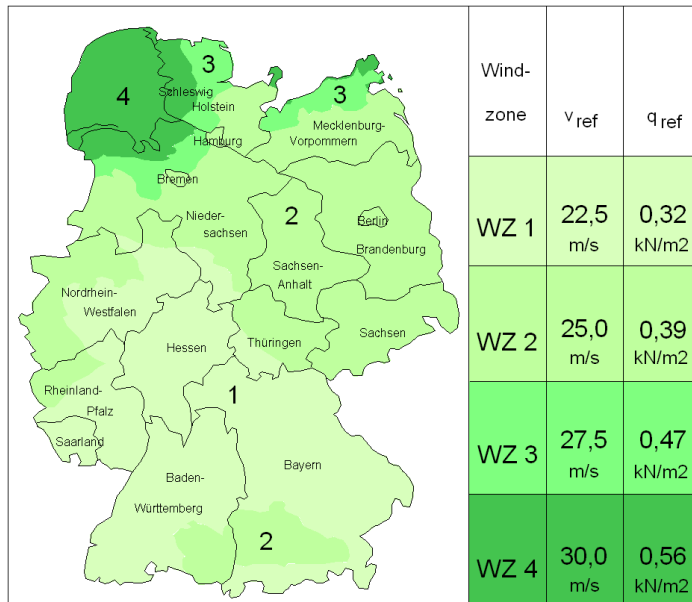


Pos. ALLa01

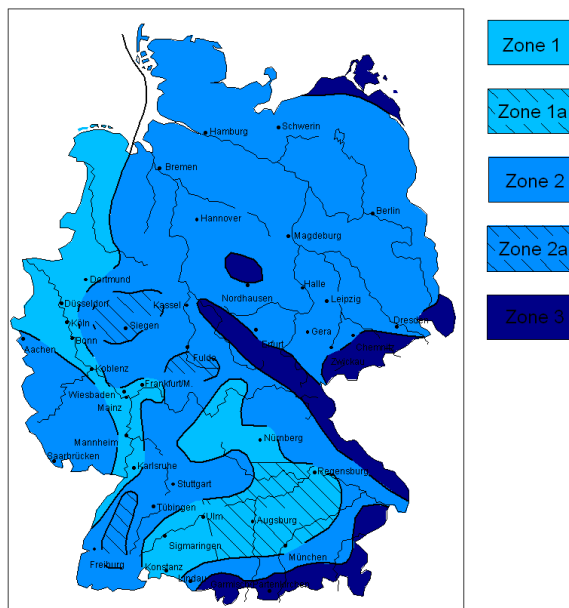
Wind- und Schneelastzonen

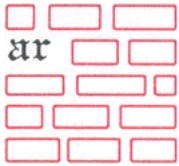
Gebäude				
Gebäudestandort	Postleitzahl	PLZ =	77948	
	Ortsname	Ort =	Friesenheim	
Gemeinde	Gemeindeschlüssel	AGS =	08317031	
	Kreis	Ortenaukreis		
	Bundesland	Baden-Württemberg		
Geodätische Daten	Geogr. Breite	=	48.37388	°
	Geogr. Länge	=	7.88410	°
Geograf. Daten	Geländehöhe ü. NN	H _s =	159.00	m
	Windzone	WZ =	1	
	Schneelastzone	SLZ =	1	
	char. Schneelast	S _k =	0.65	kN/m ²

Übersicht Wind



Übersicht Schnee

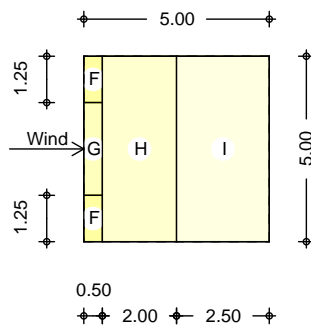




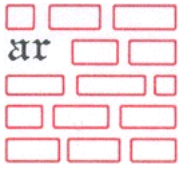
Pos. ALLa02

Flachdach mit Schnee u. Wind für Regelfall

System	Gebäudedaten			
Abmessungen	Gebäudebreite	B =	5.00	m
	Gebäudelänge	L =	5.00	m
	Gebäudehöhe (Höhe Flachdach)	H =	10.00	m
Geograf. Angaben	Geländehöhe über NN	A =	159.00	m
	Windzone	WZ =	1	
	Schneelastzone	SLZ =	1	
	Standort			Binnenland
Geometrie	Flachdach			
	scharfkantiger Traufbereich			
Wandöffnungen	geschlossene Außenwände			
Einwirkungen	Einwirkungen nach DIN EN 1990:2010-12			
Qk.S	Schnee- und Eislasten für Orte bis NN + 1000 m			
	Schneeeinwirkung			
	Qk.S min/max Werte			
Qk.W	Wind			
	Windlasten			
	Qk.W min/max Werte			
Windlasten	Windlastermittlung nach DIN EN 1991-1-4:2010-12			
	Ermittlung im Regelfall nach NA.B.3.3			
	Anströmrichtung 0° auf Traufe links			
	Basiswindgeschwindigkeit	$v_{b,0}$ =	22.50	m/s
	Basisgeswindigkeitsdruck	$q_{b,0}$ =	0.32	kN/m ²
	Bezugshöhe	z_e =	10.00	m
	Geschwindigkeitsdruck	q_p =	0.54	kN/m ²
	Lasteinflussfläche	A =	10.00	m ²
Qk.W.000	Bereichsgröße	e =	5.00	m
F] W] h] b] [' 1\$š				
M 1:200				



Bereich	d [m]	b [m]	$C_{pe,1}$ [-]	$C_{pe,10}$ [-]	$W_{e,10}$ [kN/m ²]
F	0.50	1.25	-2.50	-1.80	-0.98
G	0.50	2.50	-2.00	-1.20	-0.65
H	2.00	5.00	-1.20	-0.70	-0.38
I -	2.50	5.00	-0.60	-0.60	-0.33
I +	2.50	5.00	0.20	0.20	0.11

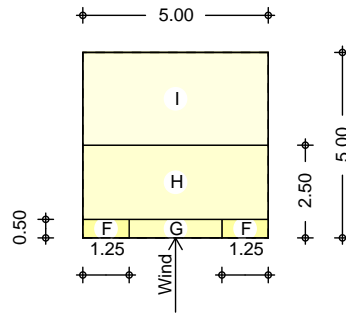


Qk. W. 090
F] W] hi b[' 1- \$s

Bereic hsgröße

e = 5.00 m

M 1: 200



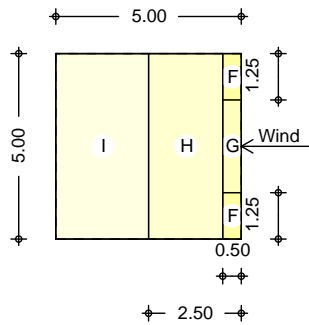
Berei ch	d [m]	b [m]	Cpe, 1 [-]	Cpe, 10 [-]	We, 10 [kN/m ²]
F	0.50	1.25	-2.50	-1.80	-0.98
G	0.50	2.50	-2.00	-1.20	-0.65
H	2.00	5.00	-1.20	-0.70	-0.38
I -	2.50	5.00	-0.60	-0.60	-0.33
I +	2.50	5.00	0.20	0.20	0.11

Qk. W. 180
F] W] hi b[' 1% \$s

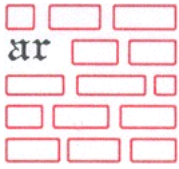
Bereic hsgröße

e = 5.00 m

M 1: 200



Berei ch	d [m]	b [m]	Cpe, 1 [-]	Cpe, 10 [-]	We, 10 [kN/m ²]
F	0.50	1.25	-2.50	-1.80	-0.98
G	0.50	2.50	-2.00	-1.20	-0.65
H	2.00	5.00	-1.20	-0.70	-0.38
I -	2.50	5.00	-0.60	-0.60	-0.33
I +	2.50	5.00	0.20	0.20	0.11

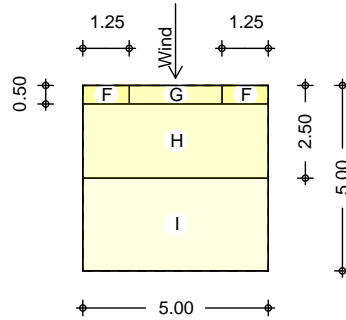


Ok. W. 270
 F] W. hi b[' 1&+\$\$

Bereichsgröße

e = 5.00 m

M 1: 200

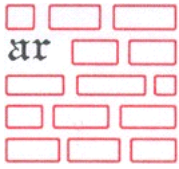


Bereich	d [m]	b [m]	Cpe, 1 [-]	Cpe, 10 [-]	We, 10 [kN/m ²]
F	0.50	1.25	-2.50	-1.80	-0.98
G	0.50	2.50	-2.00	-1.20	-0.65
H	2.00	5.00	-1.20	-0.70	-0.38
I -	2.50	5.00	-0.60	-0.60	-0.33
I +	2.50	5.00	0.20	0.20	0.11

Schneelasten

Schneelastermittlung nach DIN EN 1991-1-3: 2010-12

char. Schneelast auf Boden $S_k = 0.65 \text{ kN/m}^2$
 Formbeiwert für Schneelast $\mu = 0.80$
 Schneelast auf dem Dach $S = 0.52 \text{ kN/m}^2$



Pos. ALLa03 Lastannahmen_4

1) Beschreibung des geplanten Projektes

Die nachstehende Berechnung betrachtet ein Aluminium-Dielenprofil.
Material: EN AW-6063 T66
Es wird als Terrassen und Balkonbelag, mit einer Verkehrslast von 4,0 kN/m² betrachtet.

2) Lastannahmen

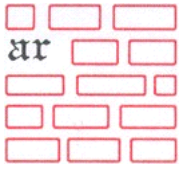
2.1) Lasten Podest

- aus Belag (Allgemein)	=	0,15	kN/m ²
- aus Konstruktion	=	0,10	kN/m ²
		<u>0,25</u>	<u>kN/m²</u>

- aus Nutzlasten $q_{k1} = 4,00 \text{ kN/m}^2$

- Mannlast $q_m = 1.0 \text{ kN/m}$

Schneelast, Windlast entsprechend der Ortslast nach La01a

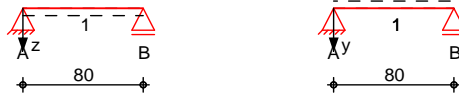


Pos. AL1-4- Alu Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 7 Dielen je Meter verlegte Elemente verteilt.

System **Einfeldträger**

M 1:50



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1	0.80	0.0	frei

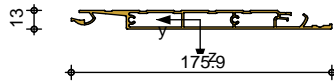
Feld	Material	Profil
1	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest
	B	0.80	fest	frei	fest	frei	fest

Lager	b [cm]
A, B	5.0

Grafik **Querschnittsgrafik**

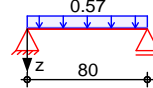
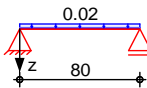
M 1:5



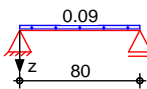
Belastungen **Belastungen auf das System**

Grafik **Belastungsgrafiken (einwirkungsbezogen)**

Einwirkungen **Gk**



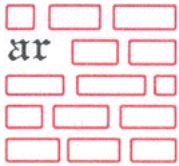
Qk. S



Streckenlasten **in z-Richtung**

Gleichlasten **Feld Komm.**

Einw.	Komm.	a [m]	s [m]	q _{li} [kN/m]	q _{re} [kN/m]	e [cm]
Einw. Gk	Eigengew	0.00	0.80		0.02	-0.2
Einw. Qk. N	p+s	0.00	0.80		0.57	0.0
Einw. Qk. S	p+s	0.00	0.80		0.09	0.0



Char. Schnittgrößen charakteristische Schnittgrößen und Verformungen

Grafik Schnittgrößen und Verformungen (je Einwirkung)

Einw. *Gk*

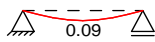
Moment $M_{y,k}$ [kNm]



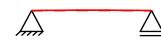
Querkraft $V_{z,k}$ [kN]



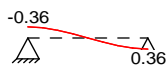
Verschiebung $w_{z,k}$ [mm]



Verdrehung $\alpha_{x,k}$ [mrad]

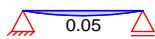


Verdrehung $\alpha_{y,k}$ [mrad]

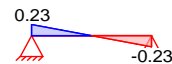


Einw. *Qk.N*

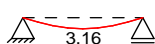
Moment $M_{y,k}$ [kNm]



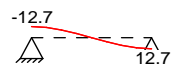
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]

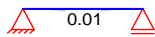


Verdrehung $\alpha_{y,k}$ [mrad]

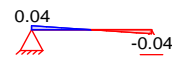


Einw. *Qk.S*

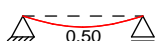
Moment $M_{y,k}$ [kNm]



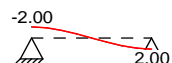
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]



Verdrehung $\alpha_{y,k}$ [mrad]



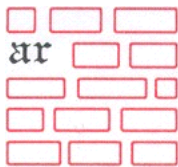
Tabelle

Schnittgrößen (je Einwirkung)

Einw.	Feld	x [m]	$M_{y,k, \min}$ [kNm]	$M_{y,k, \max}$ [kNm]	$V_{z,k, \min}$ [kN]	$V_{z,k, \max}$ [kN]
<i>Gk</i>	1	0.00	0.00	0.00	0.01	0.01*
		0.40	0.00	0.00	0.00	0.00
		0.80	0.00	0.00	-0.01*	-0.01
<i>Qk.N</i>	1	0.00	0.00	0.00	0.23	0.23*
		0.40	0.05	0.05*	0.00	0.00
		0.80	0.00	0.00	-0.23*	-0.23
<i>Qk.S</i>	1	0.00	0.00	0.00	0.04	0.04*
		0.40	0.01	0.01*	0.00	0.00
		0.80	0.00	0.00	-0.04*	-0.04

Verformungen (je Einwirkung)

Einw.	Feld	x [m]	$w_{z,k, \min}$ [mm]	$\alpha_{y,k, \min}$ [mrad]	$\alpha_{x,k, \min}$ [mrad]
<i>Gk</i>	1	0.00	0.00	-0.36*	0.00
			0.00	-0.36	0.00
		0.40	0.09	0.00	0.00
			0.09*	0.00	0.00
		0.80	0.00	0.36	0.00
		0.00	0.36*	0.00	



Ei nw. Qk. N	1	0.00	0.00	-12.65*	0.00
			0.00	-12.65	0.00
		0.40	3.16	0.00	0.00
		0.80	3.16*	0.00	0.00
Ei nw. Qk. S	1	0.00	0.00	-2.00*	0.00
			0.00	-2.00	0.00
		0.40	0.50	0.00	0.00
		0.80	0.50*	0.00	0.00
		0.00	2.00	0.00	
		0.00	2.00*	0.00	

Kombi nati onen

Kombi nati onsbi ldu ng nach DIN EN 1990
 Darstel lung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	31	1	1.35*Gk	+1.50*Qk. N (1)	+1.50*Qk. S
quasi -ständi g	12		1.00*Gk	+0.80*Qk. N (1)	

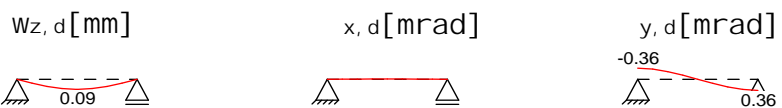
Bem. -verformungen

Bemessungsverformungen

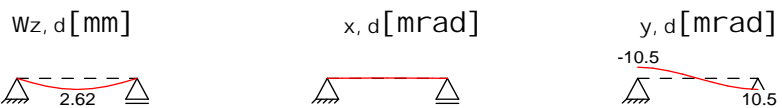
Grafi k

Verformungen (j e Kombi nati on)

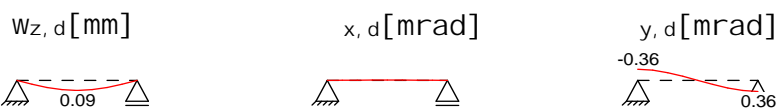
Komb. 11



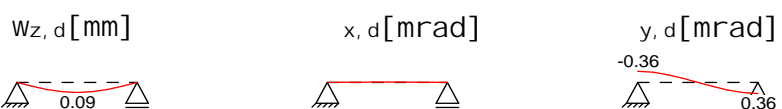
Komb. 12



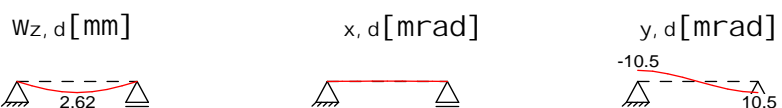
Komb. 43



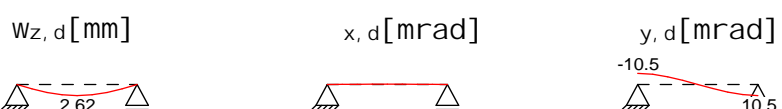
Komb. 44



Komb. 45



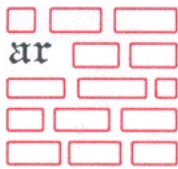
Komb. 46



Tabel l e

Verformungen (j e Kombi nati on)

	Fel d	x	Wz, d	y, d	x, d
		[m]	[mm]	[mrad]	[mrad]
Komb. 11	1	0.00	0.00	-0.36*	0.00
		0.40	0.09*	0.00	0.00



Komb. 12	1	0.80	0.00	0.36*	0.00
		0.00	0.00	-10.48*	0.00
		0.40	2.62*	0.00	0.00
Komb. 43	1	0.80	0.00	10.48*	0.00
		0.00	0.00	-0.36*	0.00
		0.40	0.09*	0.00	0.00
Komb. 44	1	0.80	0.00	0.36*	0.00
		0.00	0.00	-0.36*	0.00
		0.40	0.09*	0.00	0.00
Komb. 45	1	0.80	0.00	0.36*	0.00
		0.00	0.00	-10.48*	0.00
		0.40	2.62*	0.00	0.00
Komb. 46	1	0.80	0.00	10.48*	0.00
		0.00	0.00	-10.48*	0.00
		0.40	2.62*	0.00	0.00
		0.80	0.00	10.48*	0.00

Mat. /Querschnitt Material - und Querschnittswerte

Aluminium

Material

t _{Max} [mm]	f _o [N/mm ²]	E [N/mm ²]	BC
10 ^b	200	70000	A
25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

QS Profil A

	S _y S _z [cm ³]	I _y I _z [cm ⁴]	W _y W _z [cm ³]
1 AVADI ELE13 H13mm	6.0 1.4 12.7	1.5 141.6	2.3 16.0

Hauptachsen

QS Profil

	I _{yz} [cm ⁴]	I ₁ [cm ⁴]	I ₂ [cm ⁴]
1 AVADI ELE13 H13mm	88.10 -4.7	141.8	1.4

Torsion

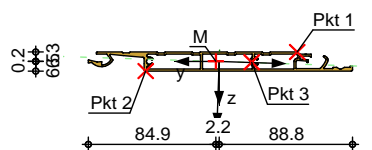
QS Profil

	I _t [cm ⁴]	I ₁ [cm ⁶]
1 AVADI ELE13 H13mm	3.7	0.0

Grafik

Querschnittsgrafik [mm]

M 1:5

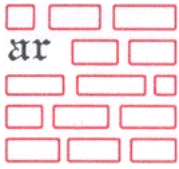


Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

Aufl.	M _{x, k, min} M _{x, k, max} [kNm]	F _{z, k, min} F _{z, k, max} [kN]	F _{y, k, min} F _{y, k, max} [kN]
	Ei nw. GK	0.00	0.01
A	0.00	0.01	0.00
B	0.00	0.01	0.00
Ei nw. Qk. N	0.00	0.01	0.00
A	0.00	0.23	0.00
B	0.00	0.23	0.00
	0.00	0.23	0.00
	0.00	0.23	0.00



Ei nw. Qk. S

A	0.00	0.04	0.00
	0.00	0.04	0.00
B	0.00	0.04	0.00
	0.00	0.04	0.00

Zusammenfassung

Zusammenfassung der Nachwei se

Nachwei se (GZT)

Nachwei se im Grenzzustand der Tragfähi gkei t

Nachwei s

Nachwei s E-E OK [-] 0.30

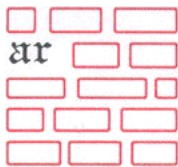
Nachwei se (GZG)

Nachwei se im Grenzzust. der Gebrauchstaugli chkei t

Nachwei s

Verformung OK [-] 0.98

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!



Pos. AL1-4-200- Alu Bpr. (Verkehrslastansatz, 4.0 kN/m²) (I/200)

Die Verkehrslast 4,0 kN/m² wird auf 7 Dielen je Meter verlegte Elemente verteilt.

System Einfeldträger

M 1:60



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
1	1	0.92	0.0	frei

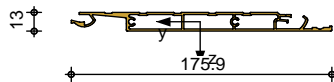
Feld	Material	Profil
1	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.
A	0.00	fest	frei	fest	frei	fest	frei
B	0.92	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B	5.0

Grafik Querschnittsgrafik

M 1:5

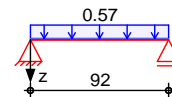
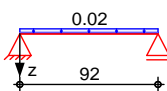


Belastungen Belastungen auf das System

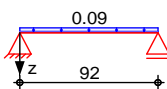
Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen

Gk Qk. N



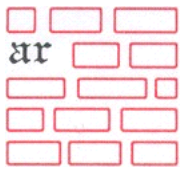
Qk. S



Streckenlasten in z-Richtung

Gleichlasten Feld Komm.

Einw.		a [m]	S [m]	q _{li} [kN/m]	q _{re} [kN/m]	e [cm]
Einw. Gk	Eiengew	0.00	0.92		0.02	-0.2
Einw. Qk. N	p+s	0.00	0.92		0.57	0.0
Einw. Qk. S	p+s	0.00	0.92		0.09	0.0



Char. Schnit tgrößen charakteri sti sche Schnit tgrößen und Verformungen

Grafi k Schnit tgrößen und Verformungen (j e Ei nwi rkung)

Ei nw. *Gk*

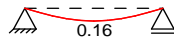
Moment $M_{y,k}$ [kNm]



Querkraft $V_{z,k}$ [kN]



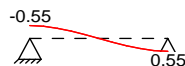
Verschi ebung $w_{z,k}$ [mm]



Verdrehung $\alpha_{x,k}$ [mrad]

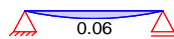


Verdrehung $\alpha_{y,k}$ [mrad]

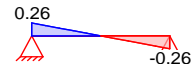


Ei nw. *Qk. N*

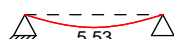
Moment $M_{y,k}$ [kNm]



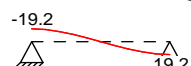
Querkraft $V_{z,k}$ [kN]



Verschi ebung $w_{z,k}$ [mm]

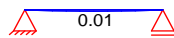


Verdrehung $\alpha_{y,k}$ [mrad]

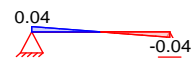


Ei nw. *Qk. S*

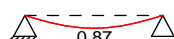
Moment $M_{y,k}$ [kNm]



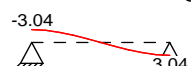
Querkraft $V_{z,k}$ [kN]



Verschi ebung $w_{z,k}$ [mm]



Verdrehung $\alpha_{y,k}$ [mrad]



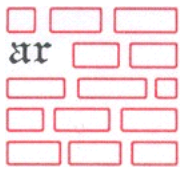
Tabel l e

Schnit tgrößen (j e Ei nwi rkung)

	Fel d	x [m]	$M_{y,k, \min}$ [kNm]	$M_{y,k, \max}$ [kNm]	$V_{z,k, \min}$ [kN]	$V_{z,k, \max}$ [kN]
Ei nw. <i>Gk</i>	1	0.00	0.00	0.00	0.01	0.01*
		0.46	0.00	0.00	0.00	0.00
		0.92	0.00	0.00	0.00	-0.01*
Ei nw. <i>Qk. N</i>	1	0.00	0.00	0.00	0.26	0.26*
		0.46	0.06	0.06*	0.00	0.00
		0.92	0.00	0.00	-0.26*	-0.26
Ei nw. <i>Qk. S</i>	1	0.00	0.00	0.00	0.04	0.04*
		0.46	0.01	0.01*	0.00	0.00
		0.92	0.00	0.00	-0.04*	-0.04

Verformungen (j e Ei nwi rkung)

	Fel d	x [m]	$w_{z,k, \min}$ [mm]	$\alpha_{y,k, \min}$ [mrad]	$\alpha_{x,k, \min}$ [mrad]
Ei nw. <i>Gk</i>	1	0.00	0.00	-0.55*	0.00
			0.00	-0.55	0.00
		0.46	0.16	0.00	0.00
			0.16*	0.00	0.00
		0.92	0.00	0.55	0.00
		0.00	0.55*	0.00	



Ei nw. Qk. N	1	0.00	0.00	-19.24*	0.00
			0.00	-19.24	0.00
		0.46	5.53	0.00	0.00
			5.53*	0.00	0.00
Ei nw. Qk. S	1	0.00	0.00	19.24	0.00
			0.00	19.24*	0.00
		0.46	0.87	-3.04*	0.00
			0.87*	0.00	0.00
		0.92	0.00	3.04	0.00
			0.00	3.04*	0.00

Kombi nati onen

Kombi nati onsbi l dung nach DIN EN 1990
Darstel lung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	31	1	1.35*Gk	+1.50*Qk. N (1)	+1.50*Qk. S
quasi -ständi g	12		1.00*Gk	+0.80*Qk. N (1)	

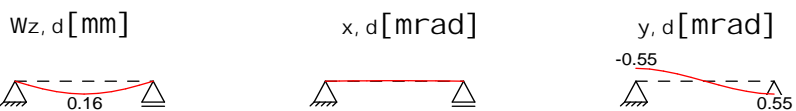
Bem. -verformungen

Bemessungsverformungen

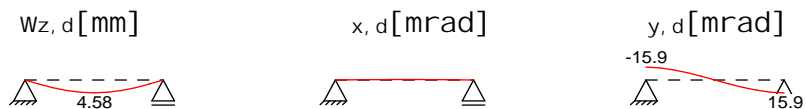
Grafi k

Verformungen (j e Kombi nati on)

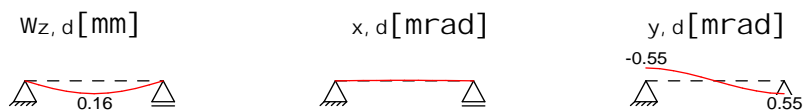
Komb. 11



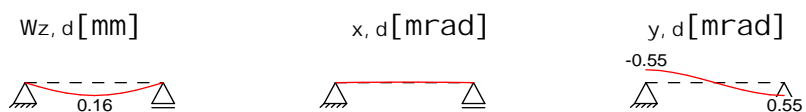
Komb. 12



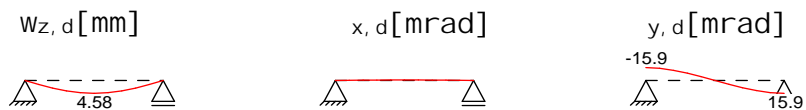
Komb. 43



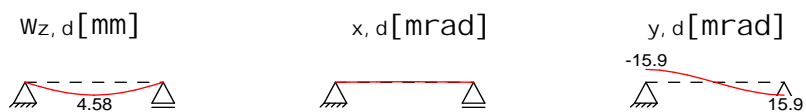
Komb. 44



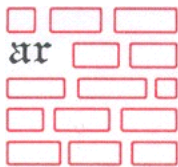
Komb. 45



Komb. 46



Tabel l e



Verformungen (j e Kombi nati on)

Fel d	X [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]	
Komb. 11	1	0.00	0.00	-0.55*	0.00
		0.46	0.16*	0.00	0.00
		0.92	0.00	0.55*	0.00
Komb. 12	1	0.00	0.00	-15.94*	0.00
		0.46	4.58*	0.00	0.00
		0.92	0.00	15.94*	0.00
Komb. 43	1	0.00	0.00	-0.55*	0.00
		0.46	0.16*	0.00	0.00
		0.92	0.00	0.55*	0.00
Komb. 44	1	0.00	0.00	-0.55*	0.00
		0.46	0.16*	0.00	0.00
		0.92	0.00	0.55*	0.00
Komb. 45	1	0.00	0.00	-15.94*	0.00
		0.46	4.58*	0.00	0.00
		0.92	0.00	15.94*	0.00
Komb. 46	1	0.00	0.00	-15.94*	0.00
		0.46	4.58*	0.00	0.00
		0.92	0.00	15.94*	0.00

Mat. /Querschni tt

Material - und Querschni ttswerte

Al umi ni um

Material	t _{Max} [mm]	f _o [N/mm ²]	E [N/mm ²]	BC
EN-AW 6063, T66, EP	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden di e ungünsti geren Festi gkei ten j e Querschni tt angesetzt (Tab. 3.2b, Fußnote 3)

Querschni tt

QS Profi l	A [cm ²]	S _y S _z [cm ³]	I _y I _z [cm ⁴]	W _y W _z [cm ³]
1 AVADI ELE13 H13mm	6.0	1.4 12.7	1.5 141.6	2.3 16.0

Hauptachsen

QS Profi l	[°]	I _{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1 AVADI ELE13 H13mm	88.10	-4.7	141.8	1.4

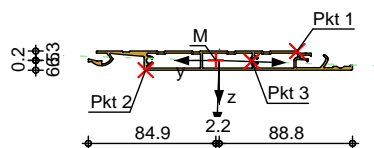
Torsi on

QS Profi l	I _t [cm ⁴]	I [cm ⁶]
1 AVADI ELE13 H13mm	3.7	0.0

Grafi k

Querschni ttsgrafi k [mm]

M 1: 5

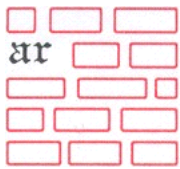


Aufl agerkräfte

Charakteri sti sche Aufl agerkräfte (gl obal)

Char. Aufl agerkr.

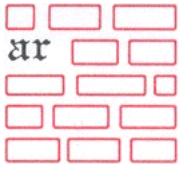
Aufl .	M _{x, k, mi n} M _{x, k, max} [kNm]	F _{Z, k, mi n} F _{Z, k, max} [kN]	F _{y, k, mi n} F _{y, k, max} [kN]	
Ei nw. GK	A	0.00	0.01	0.00



		0.00	0.01	0.00
	B	0.00	0.01	0.00
		0.00	0.01	0.00
Ei nw. Qk. N	A	0.00	0.26	0.00
		0.00	0.26	0.00
	B	0.00	0.26	0.00
		0.00	0.26	0.00
Ei nw. Qk. S	A	0.00	0.04	0.00
		0.00	0.04	0.00
	B	0.00	0.04	0.00
		0.00	0.04	0.00

Zusammenfassung	Zusammenfassung der Nachwei se		
Nachwei se (GZT)	Nachwei se im Grenzzustand der Tragfähi gkei t		
	Nachwei s		
			[-]
	Nachwei s E-E	OK	0.39
Nachwei se (GZG)	Nachwei se im Grenzzust. der Gebrauchstaugli chkei t		
	Nachwei s		
			[-]
	Verformung	OK	1.00

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!



Pos. AL2-4- Alu Bpr Kragarm (VL, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 7 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:50



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1	0.50	0.0	frei
	Kr	0.30	0.0	frei

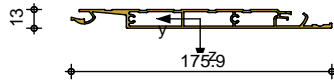
Feld	Material	Profil
1-Kr	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,x}	Gabel I.	Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest	frei
	B	0.50	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B	5.0

Grafik Querschnittsgrafik

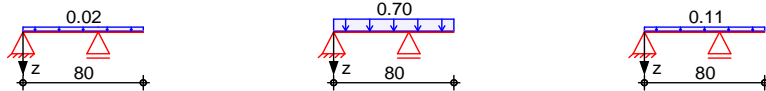
M 1:5



Belastungen Belastungen auf das System

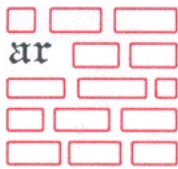
Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen Gk Qk.N Qk.S



Streckenlasten in z-Richtung

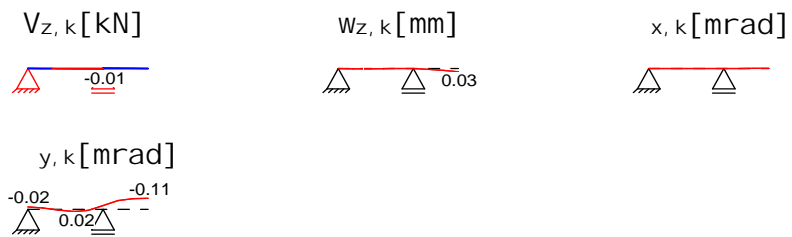
Gleichlasten		a	s	q _{li}	q _{re}	e
Feld Komm.		[m]	[m]	[kN/m]	[kN/m]	[cm]
Einw. Gk	1 Eiengew	0.00	0.50		0.02	-0.2
	Kr Eiengew	0.00	0.30		0.02	-0.2
Einw. Qk.N	1 p+s	0.00	0.80		0.70	0.0
Einw. Qk.S	1 p+s	0.00	0.80		0.11	0.0



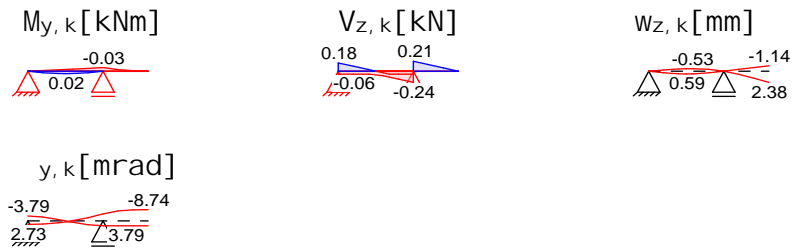
Char. Schnit tgrößen charakteri sti sche Schnit tgrößen und Verformungen

Grafi k Schnit tgrößen und Verformungen (je Ei nwi rkung)

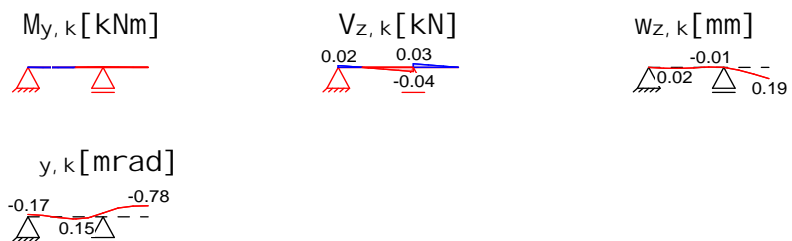
Ei nw. *Gk*



Ei nw. *Qk. N*



Ei nw. *Qk. S*



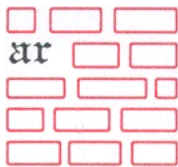
Tabel l e

Schnit tgrößen (je Ei nwi rkung)

	Fel d	x [m]	My, k, mi n [kNm]	My, k, max [kNm]	Vz, k, mi n [kN]	Vz, k, max [kN]
Ei nw. <i>Gk</i>	1	0.00	0.00	0.00	0.00	0.00
		0.50	0.00	0.00	-0.01*	-0.01
Ei nw. <i>Qk. N</i>	1	0.00	0.00	0.00	-0.06	0.18
		0.25	-0.02	0.02*	-0.08	0.00
		0.50	-0.03*	0.00	-0.24*	-0.06
	Kr	0.00	-0.03	0.00	0.00	0.21*
Ei nw. <i>Qk. S</i>	1	0.00	0.00	0.00	0.02	0.02
		0.16	0.00	0.00	0.00	0.00
		0.50	0.00	0.00	-0.04*	-0.04
	Kr	0.00	0.00	0.00	0.03	0.03*
		0.30	0.00	0.00	0.00	0.00

Verformungen (je Ei nwi rkung)

	Fel d	x [m]	Wz, k, mi n [mm]	y, k, mi n [mrad]	x, k, mi n [mrad]
Ei nw. <i>Gk</i>	1	0.00	0.00	-0.02	0.00
			0.00	-0.02	0.00
		0.32	0.00	0.02	0.00
			0.00	0.02*	0.00
		0.40	0.00	0.01	0.00



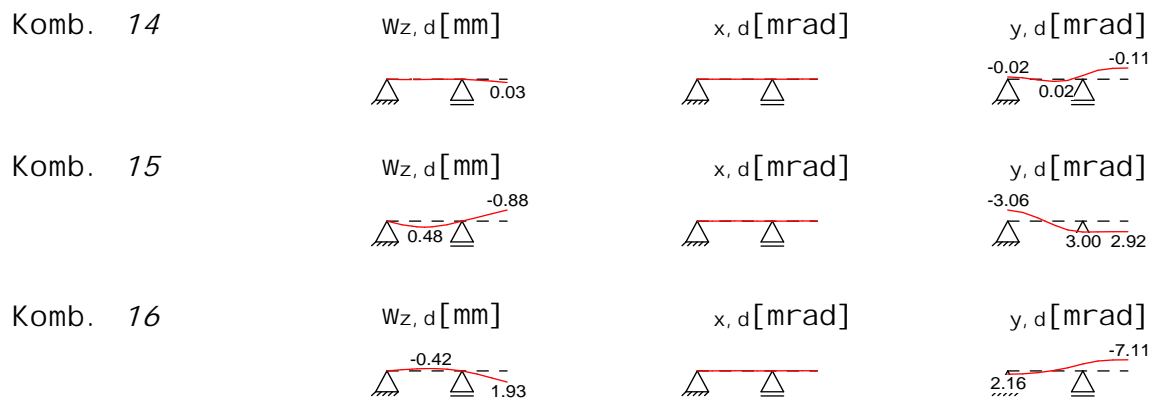
		0.50	0.00	-0.04	0.00
			0.00	-0.04	0.00
	Kr	0.00	0.00	-0.04	0.00
			0.00	-0.04	0.00
		0.30	0.03	-0.11*	0.00
			0.03*	-0.11	0.00
Ei nw. Qk. N	1	0.00	0.00	-3.79	0.00
			0.00	2.73	0.00
		0.50	0.00	-5.46	0.00
			0.00	3.79*	0.00
	Kr	0.00	0.00	-5.46	0.00
			0.00	3.79	0.00
		0.30	-1.14	-8.74*	0.00
			2.38*	3.79	0.00
Ei nw. Qk. S	1	0.00	0.00	-0.17	0.00
			0.00	-0.17	0.00
		0.32	0.00	0.15	0.00
			0.00	0.15*	0.00
		0.40	-0.01*	0.08	0.00
			-0.01	0.08	0.00
		0.50	0.00	-0.26	0.00
			0.00	-0.26	0.00
	Kr	0.00	0.00	-0.26	0.00
			0.00	-0.26	0.00
		0.30	0.19	-0.78*	0.00
			0.19*	-0.78	0.00

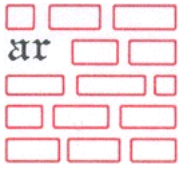
Kombi nati onen Kombi nati onsbi ldung nach DIN EN 1990
 Darstel lung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	37	1	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
	38	2	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
	41	5	1.35*Gk	+1.50*Qk. N (2)	+1.50*Qk. S
quasi -ständi g	15		1.00*Gk	+0.80*Qk. N (1)	
	16		1.00*Gk	+0.80*Qk. N (2)	

Bem. -verformungen Bemessungsverformungen

Grafi k Verformungen (j e Kombi nati on)



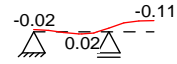
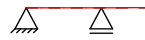
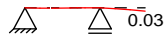


Komb. 55

Wz, d [mm]

x, d [mrad]

y, d [mrad]

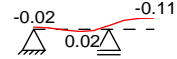
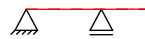
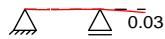


Komb. 56

Wz, d [mm]

x, d [mrad]

y, d [mrad]

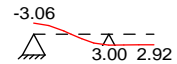
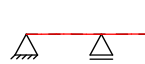
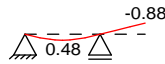


Komb. 57

Wz, d [mm]

x, d [mrad]

y, d [mrad]

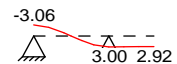
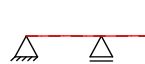
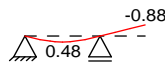


Komb. 58

Wz, d [mm]

x, d [mrad]

y, d [mrad]

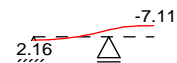
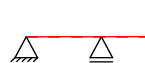
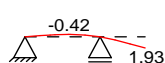


Komb. 59

Wz, d [mm]

x, d [mrad]

y, d [mrad]

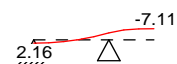
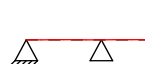
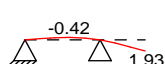


Komb. 60

Wz, d [mm]

x, d [mrad]

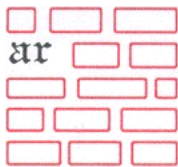
y, d [mrad]



Tabelle

Verformungen (je Kombination)

	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 14	1	0.00	0.00	-0.02	0.00
		0.32	0.00	0.02*	0.00
		0.40	0.00	0.01	0.00
		0.50	0.00	-0.04	0.00
	Kr	0.00	0.00	-0.04	0.00
Komb. 15	1	0.00	0.00	-3.06*	0.00
		0.25	0.48*	0.01	0.00
		0.50	0.00	3.00*	0.00
		0.00	0.00	3.00	0.00
	Kr	0.30	-0.88*	2.92	0.00
Komb. 16	1	0.00	0.00	2.16*	0.00
		0.29	-0.42*	-0.01	0.00
		0.50	0.00	-4.41	0.00
		0.00	0.00	-4.41	0.00
	Kr	0.30	1.93*	-7.11*	0.00
Komb. 55	1	0.00	0.00	-0.02	0.00
		0.32	0.00	0.02*	0.00
		0.40	0.00	0.01	0.00
		0.50	0.00	-0.04	0.00
	Kr	0.00	0.00	-0.04	0.00
Komb. 56	1	0.00	0.00	-0.02	0.00
		0.32	0.00	0.02*	0.00
		0.40	0.00	0.01	0.00
		0.50	0.00	-0.04	0.00
	Kr	0.00	0.00	-0.04	0.00
Komb. 57	1	0.00	0.00	-3.06*	0.00
		0.25	0.48*	0.01	0.00
		0.50	0.00	3.00*	0.00
		0.00	0.00	3.00	0.00
	Kr	0.30	-0.88*	2.92	0.00



		0.50	0.00	3.00*	0.00
	Kr	0.00	0.00	3.00	0.00
		0.30	-0.88*	2.92	0.00
Komb. 58	1	0.00	0.00	-3.06*	0.00
		0.25	0.48*	0.01	0.00
		0.50	0.00	3.00*	0.00
	Kr	0.00	0.00	3.00	0.00
		0.30	-0.88*	2.92	0.00
Komb. 59	1	0.00	0.00	2.16*	0.00
		0.29	-0.42*	-0.01	0.00
		0.50	0.00	-4.41	0.00
	Kr	0.00	0.00	-4.41	0.00
		0.30	1.93*	-7.11*	0.00
Komb. 60	1	0.00	0.00	2.16*	0.00
		0.29	-0.42*	-0.01	0.00
		0.50	0.00	-4.41	0.00
	Kr	0.00	0.00	-4.41	0.00
		0.30	1.93*	-7.11*	0.00

Mat. / Querschnitt Material - und Querschnittswerte

Aluminium	Material	t _{Max} [mm]	f ₀ [N/mm ²]	E [N/mm ²]	BC
	EN-AW 6063, T66, EP	10 ^b	200	70000	A
		25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

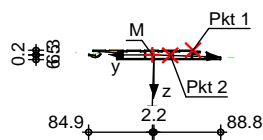
Querschnitt	QS Profil	A	S _y S _z [cm ³]	I _y I _z [cm ⁴]	W _y W _z [cm ³]
	1 AVADI ELE13 H13mm	6.0	1.4 12.7	1.5 141.6	2.3 16.0

Hauptachsen	QS Profil	[°]	I _{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
	1 AVADI ELE13 H13mm	88.10	-4.7	141.8	1.4

Torsion	QS Profil	I _t [cm ⁴]	I [cm ⁶]
	1 AVADI ELE13 H13mm	3.7	0.0

Grafik Querschnittsgrafik [mm]

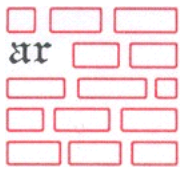
M 1:10



Auflagerkräfte Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

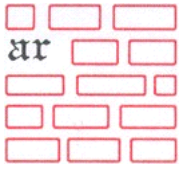
	Aufl.	M _{x, k, min} M _{x, k, max} [kNm]	F _{z, k, min} F _{z, k, max} [kN]	F _{y, k, min} F _{y, k, max} [kN]
Ei nw. GK	A	0.00	0.00	0.00
	B	0.00	0.01	0.00
Ei nw. Qk N	A	0.00	-0.06	0.00
		0.00	0.18	0.00



Ei nw. <i>Ok. S</i>	B	0.00	0.18	0.00
		0.00	0.45	0.00
	A	0.00	0.02	0.00
		0.00	0.02	0.00
	B	0.00	0.07	0.00
		0.00	0.07	0.00

Zusammenfassung	Zusammenfassung der Nachwei se			
Nachwei se (GZT)	Nachwei se im Grenzzustand der Tragfähi gkei t			
	Nachwei s			[-]
	Nachwei s E-E		OK	0.20
Nachwei se (GZG)	Nachwei se im Grenzzust. der Gebrauchstauglichkei t			
	Nachwei s			[-]
	Verformung		OK	0.96

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
 Kürzere Spannweiten sind möglich!



Pos. AL1-4-2-Feld Alu Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 7 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:110



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1-2	0.90	0.0	frei

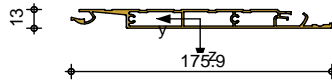
Feld	Material	Profil
1-2	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest
	B	0.90	fest	frei	fest	frei	fest
	C	1.80	fest	frei	fest	frei	fest

Lager	b [cm]
A, B, C	5.0

Grafik Querschnittsgrafik

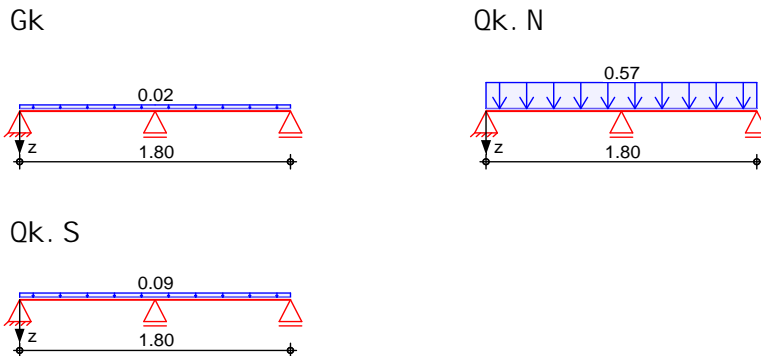
M 1:5



Belastungen Belastungen auf das System

Grafik Belastungsgrafiken (einwirkungsbezogen)

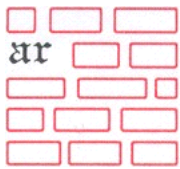
Einwirkungen



Streckenlasten in z-Richtung

Gleichlasten Feld Komm.

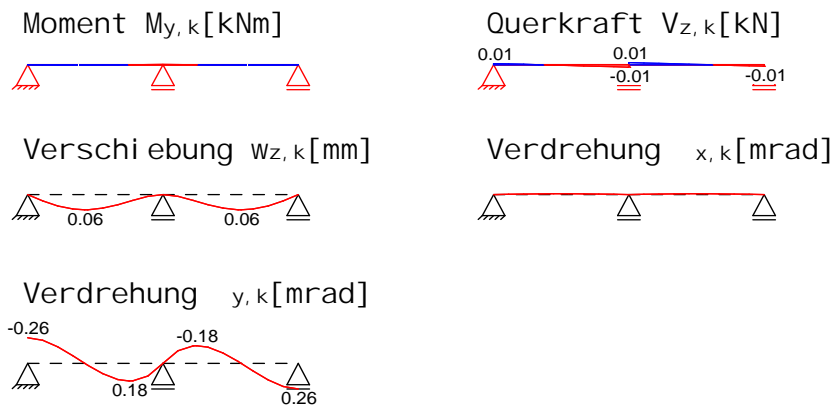
		a [m]	s [m]	q _{li} [kN/m]	q _{re} [kN/m]	e [cm]
Einw. Gk	1 Eiengew	0.00	0.90		0.02	-0.2
	2 Eiengew	0.00	0.90		0.02	-0.2
Einw. Qk, N	1 p+s	0.00	1.80		0.57	0.0
Einw. Qk, S	1 p+s	0.00	1.80		0.09	0.0



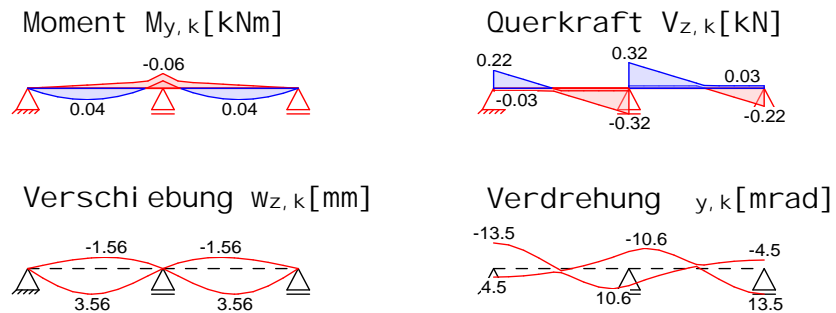
Char. Schnittgrößen charakteristische Schnittgrößen und Verformungen

Grafik Schnittgrößen und Verformungen (je Einwirkung)

Einw. *Gk*



Einw. *Qk, N*



Einw. *Qk, S*

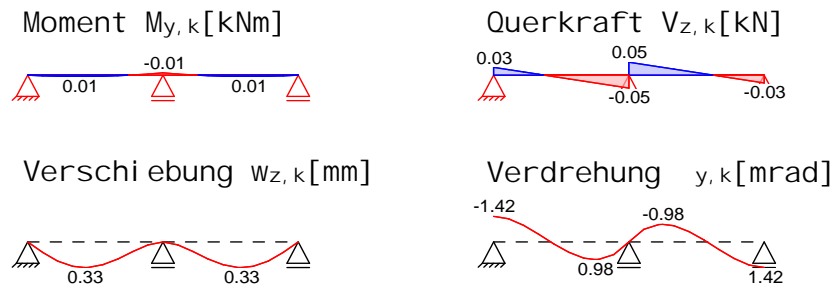
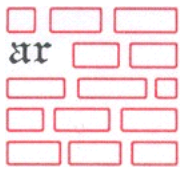


Tabelle Schnittgrößen (je Einwirkung)

Einw.	Feld	x [m]	$M_{y,k, \min}$ [kNm]	$M_{y,k, \max}$ [kNm]	$V_{z,k, \min}$ [kN]	$V_{z,k, \max}$ [kN]
<i>Gk</i>	1	0.00	0.00	0.00	0.01	0.01
		0.34	0.00	0.00	0.00	0.00
	2	0.90	0.00	0.00	-0.01*	-0.01
		0.00	0.00	0.00	0.01	0.01*
<i>Qk, N</i>	1	0.00	0.00	0.00	-0.03	0.22
		0.39	-0.01	0.04*	-0.04	0.00
		0.90	-0.06*	-0.03	-0.32*	-0.03
	2	0.00	-0.06	-0.03	0.03	0.32*
<i>Qk, S</i>	1	0.00	0.00	0.00	0.03	0.03
		0.34	0.01	0.01*	0.00	0.00
		0.90	-0.01*	-0.01	-0.05*	-0.05
	2	0.00	-0.01	-0.01	0.05	0.05*
		0.90	0.00	0.00	-0.03	-0.03



Verformungen (je Einwirkung)

	Feld	x [m]	Wz, k, min	y, k, min	x, k, min
			Wz, k, max	y, k, max	x, k, max
			[mm]	[mrad]	[mrad]
Einw. Gk	1	0.00	0.00	-0.26*	0.00
		0.38	0.06	0.00	0.00
	2	0.45	0.06*	0.00	0.00
		0.90	0.06	0.06	0.00
		0.90	0.00	0.00	0.00
		0.90	0.00	0.00	0.00
Einw. Qk. N	1	0.00	0.00	-13.51*	0.00
		0.43	-1.47	4.50	0.00
	2	0.52	3.56*	-0.03	0.00
		0.90	-1.56*	2.00	0.00
		0.90	3.33	-0.03	0.00
		0.90	0.00	4.35	0.00
Einw. Qk. S	1	0.00	0.00	-9.01	0.00
		0.38	0.00	9.01	0.00
	2	0.90	0.00	-9.01	0.00
		0.90	0.00	9.01	0.00
		0.90	0.00	-4.50	0.00
		0.90	0.00	13.51*	0.00

Kombinationen

Kombinationsbildung nach DIN EN 1990
Darstellung der maßgebenden Kombinationen

	Ek	Imp.	(* *EW)
ständig/vorüberg.	38	1	1.35*Gk +1.50*Qk. N +1.50*Qk. S (1, 2)
quasi-ständig	15		1.00*Gk +0.80*Qk. N (1)
	16		1.00*Gk +0.80*Qk. N (2)

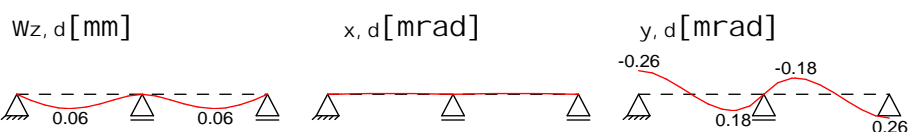
Bem.-verformungen

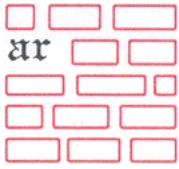
Bemessungsverformungen

Grafik

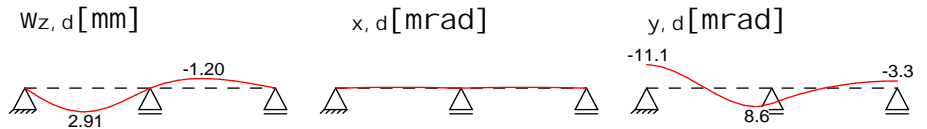
Verformungen (je Kombination)

Komb. 14

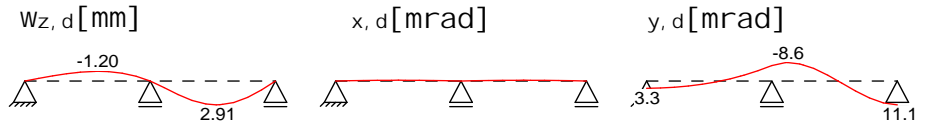




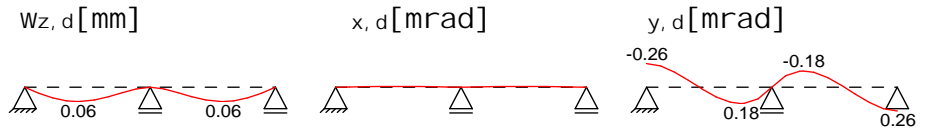
Komb. 15



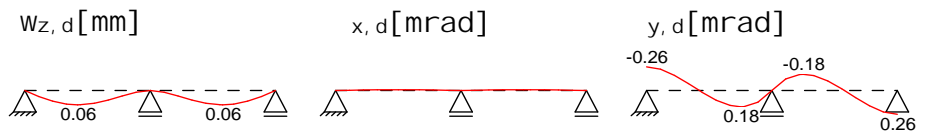
Komb. 16



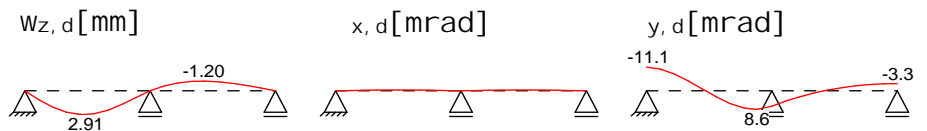
Komb. 56



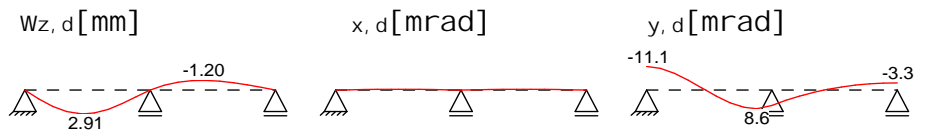
Komb. 57



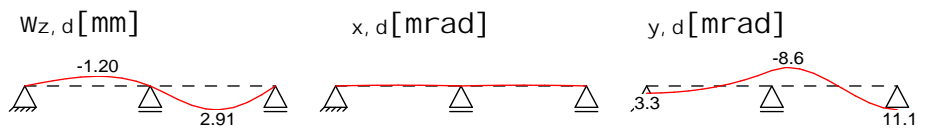
Komb. 58



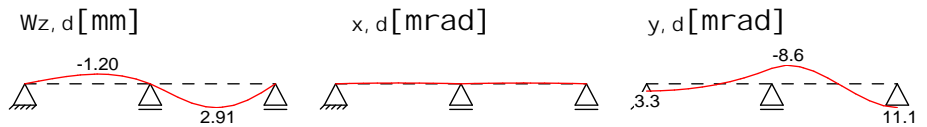
Komb. 59



Komb. 60



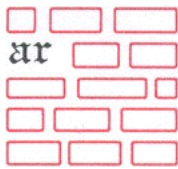
Komb. 61



Tabelle

Verformungen (je Kombination)

Komb.	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 14	1	0.00	0.00	-0.26*	0.00
		0.38	0.06*	0.00	0.00
		0.45	0.06	0.06	0.00
		0.90	0.00	0.00	0.00
		0.90	0.00	0.00	0.26*
Komb. 15	1	0.00	0.00	-11.07*	0.00
		0.43	2.91*	0.02	0.00
		0.45	2.87	0.93	0.00
		0.79	0.92	8.63*	0.00
		0.90	0.00	7.21	0.00
		0.90	0.00	7.21	0.00



		0.38	-1.20*	-0.09	0.00
		0.90	0.00	-3.35	0.00
Komb. 16	1	0.00	0.00	3.35	0.00
		0.45	-1.14	0.93	0.00
		0.52	-1.20*	0.09	0.00
		0.90	0.00	-7.21	0.00
	2	0.00	0.00	-7.21	0.00
		0.11	0.92	-8.63*	0.00
		0.47	2.91*	-0.02	0.00
		0.90	0.00	11.07*	0.00
Komb. 56	1	0.00	0.00	-0.26*	0.00
		0.38	0.06*	0.00	0.00
		0.45	0.06	0.06	0.00
		0.90	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
		0.90	0.00	0.26*	0.00
Komb. 57	1	0.00	0.00	-0.26*	0.00
		0.38	0.06*	0.00	0.00
		0.45	0.06	0.06	0.00
		0.90	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
		0.90	0.00	0.26*	0.00
Komb. 58	1	0.00	0.00	-11.07*	0.00
		0.43	2.91*	0.02	0.00
		0.45	2.87	0.93	0.00
		0.79	0.92	8.63*	0.00
		0.90	0.00	7.21	0.00
	2	0.00	0.00	7.21	0.00
		0.38	-1.20*	-0.09	0.00
		0.90	0.00	-3.35	0.00
Komb. 59	1	0.00	0.00	-11.07*	0.00
		0.43	2.91*	0.02	0.00
		0.45	2.87	0.93	0.00
		0.79	0.92	8.63*	0.00
		0.90	0.00	7.21	0.00
	2	0.00	0.00	7.21	0.00
		0.38	-1.20*	-0.09	0.00
		0.90	0.00	-3.35	0.00
Komb. 60	1	0.00	0.00	3.35	0.00
		0.45	-1.14	0.93	0.00
		0.52	-1.20*	0.09	0.00
		0.90	0.00	-7.21	0.00
	2	0.00	0.00	-7.21	0.00
		0.11	0.92	-8.63*	0.00
		0.47	2.91*	-0.02	0.00
		0.90	0.00	11.07*	0.00
Komb. 61	1	0.00	0.00	3.35	0.00
		0.45	-1.14	0.93	0.00
		0.52	-1.20*	0.09	0.00
		0.90	0.00	-7.21	0.00
	2	0.00	0.00	-7.21	0.00
		0.11	0.92	-8.63*	0.00
		0.47	2.91*	-0.02	0.00
		0.90	0.00	11.07*	0.00

Mat. / Querschnitt

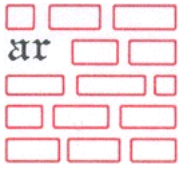
Material - und Querschnittswerte

Aluminium

Material

	t _{Max} [mm]	f ₀ [N/mm ²]	E [N/mm ²]	BC
<i>EN-AW 6063, T66, EP</i>	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)



Querschnitt

QS	Profil	A	S _y S _z	I _y I _z	W _y W _z
		[cm ²]	[cm ³]	[cm ⁴]	[cm ³]
1	AVADI ELE13 H13mm	6.0	1.4 12.7	1.5 141.6	2.3 16.0

Hauptachsen

QS	Profil	[°]	I _{yz}	I	I
			[cm ⁴]	[cm ⁴]	[cm ⁴]
1	AVADI ELE13 H13mm	88.10	-4.7	141.8	1.4

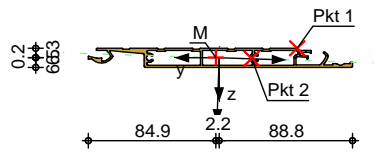
Torsion

QS	Profil	I _t	I
		[cm ⁴]	[cm ⁶]
1	AVADI ELE13 H13mm	3.7	0.0

Grafik

Querschnittsgrafik [mm]

M 1:5



Auflagerkräfte

Charakteristische Auflagerkräfte (gl obal)

Char. Auflagerkr.

	Aufl.	M _{x, k, min} M _{x, k, max}	F _{z, k, min} F _{z, k, max}	F _{y, k, min} F _{y, k, max}
		[kNm]	[kN]	[kN]
Ei nw. Gk	A	0.00	0.01	0.00
	B	0.00	0.01	0.00
	C	0.00	0.02	0.00
		0.00	0.02	0.00
Ei nw. Qk. N	A	0.00	-0.03	0.00
	B	0.00	0.22	0.00
	C	0.00	0.32	0.00
		0.00	0.64	0.00
Ei nw. Qk. S	A	0.00	-0.03	0.00
	B	0.00	0.22	0.00
	C	0.00	0.10	0.00
		0.00	0.10	0.00

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

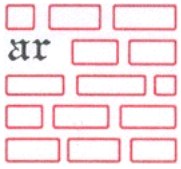
Nachweis E-E OK [-] 0.37

Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung OK [-] 0.97



PROJEKT **19259-1Aludiele 2019 AVA**

POSITION **AL1-4-2-Feld Alu Bpr. (Verkehrslastansatz $24,0 \text{ kN/m}^2$)**

SEITE

30

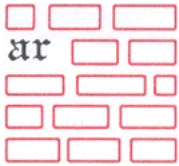
PROJ.-NR.

19259_1

19.03.2019

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!

mb-Viewer Version 2019 - Copyright 2018 - mb AEC Software GmbH



Pos. AL1-4-2-Feld-200 Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 7 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:125



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1-2	1.04	0.0	frei

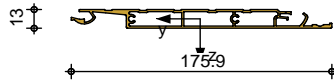
Feld	Material	Profil
1-2	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest
	B	1.04	fest	frei	fest	frei	fest
	C	2.08	fest	frei	fest	frei	fest

Lager	b [cm]
A, B, C	5.0

Grafik Querschnittsgrafik

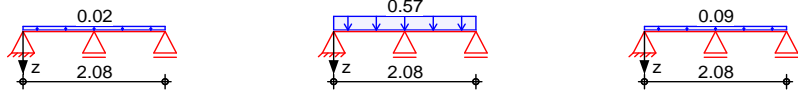
M 1:5



Belastungen Belastungen auf das System

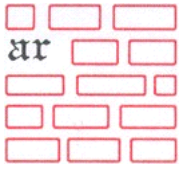
Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen Gk Qk. N Qk. S



Streckenlasten in z-Richtung

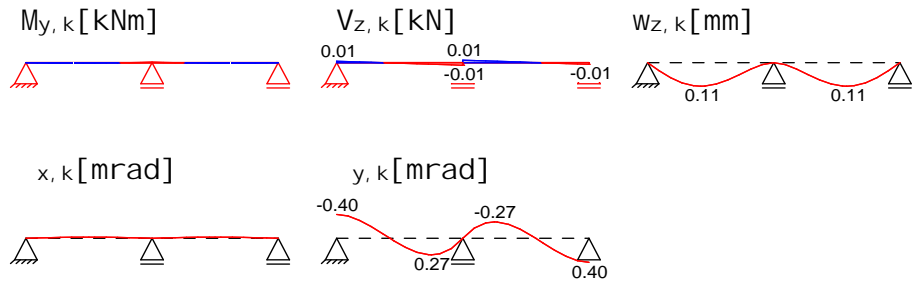
Gleichlasten		a	S	q _{li}	q _{re}	e
Feld Komm.		[m]	[m]	[kN/m]	[kN/m]	[cm]
Einw. Gk	1 Eiengew	0.00	1.04		0.02	-0.2
	2 Eiengew	0.00	1.04		0.02	-0.2
Einw. Qk. N	1 p+s	0.00	2.08		0.57	0.0
Einw. Qk. S	1 p+s	0.00	2.08		0.09	0.0



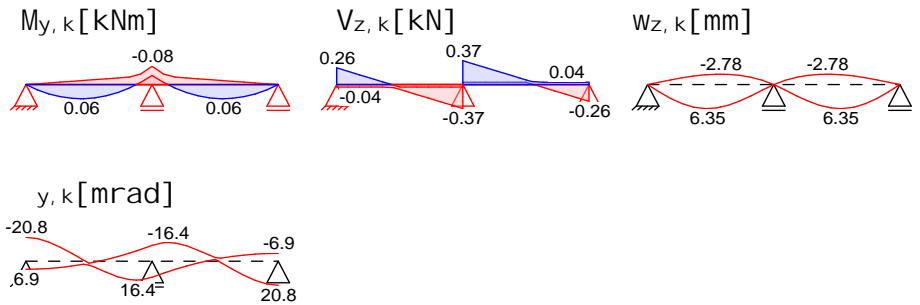
Char. Schnittgrößen charakteristische Schnittgrößen und Verformungen

Grafik Schnittgrößen und Verformungen (je Einwirkung)

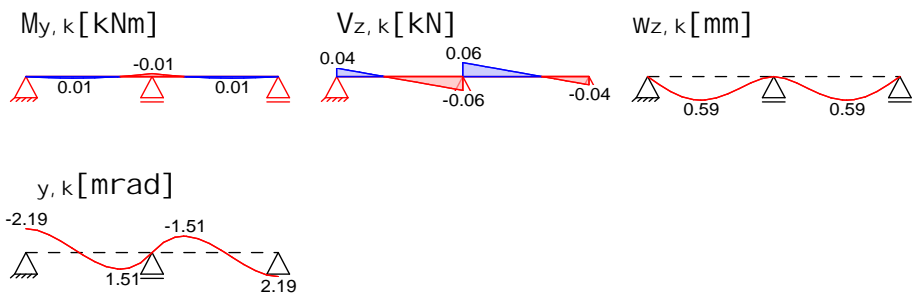
Einw. G_k



Einw. Q_k, N



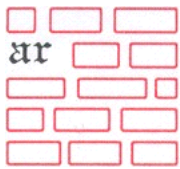
Einw. Q_k, S



Tabelle

Schnittgrößen (je Einwirkung)

	Feld	x [m]	$M_{y, k, \min}$ [kNm]	$M_{y, k, \max}$ [kNm]	$V_{z, k, \min}$ [kN]	$V_{z, k, \max}$ [kN]
Einw. G_k	1	0.00	0.00	0.00	0.01	0.01
		0.39	0.00	0.00	0.00	0.00
		1.04	0.00	0.00	-0.01*	-0.01
Einw. Q_k, N	1	0.00	0.00	0.00	0.01	0.01*
		0.46	-0.02	0.06*	-0.05	0.00
		1.04	-0.08*	-0.04	-0.37*	-0.04
Einw. Q_k, S	1	0.00	-0.08	-0.04	0.04	0.37*
		1.04	0.00	0.00	-0.26	0.04
		0.00	0.00	0.00	0.04	0.04
Einw. G_k	2	0.00	0.01	0.01*	0.00	0.00
		0.39	0.01	0.01*	0.00	0.00
		1.04	-0.01*	-0.01	-0.06*	-0.06
Einw. Q_k, N	2	0.00	-0.01	-0.01	0.06	0.06*
		1.04	0.00	0.00	-0.04	-0.04
		0.00	0.00	0.00	0.06	0.06*



Verformungen (je Einwirkung)

	Feld	x [m]	Wz, k, min	y, k, min	x, k, min
			Wz, k, max	y, k, max	x, k, max
			[mm]	[mrad]	[mrad]
Einw. Gk	1	0.00	0.00	-0.40*	0.00
		0.44	0.11	0.00	0.00
	2	0.52	0.10	0.00	0.00
		1.04	0.10	0.10	0.00
	2	0.00	0.00	0.00	0.00
		1.04	0.00	0.40	0.00
Einw. Qk. N	1	0.00	0.00	-20.85*	0.00
		0.49	-2.64	-0.02	0.00
	2	0.60	6.35*	2.94	0.00
		1.04	-2.78*	-0.04	0.00
	2	0.00	5.94	6.79	0.00
		1.04	0.00	-13.90	0.00
Einw. Qk. S	1	0.00	0.00	20.85*	0.00
		0.44	0.59	0.00	0.00
	2	1.04	0.59*	0.00	0.00
		0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
		1.04	0.00	2.19	0.00

Kombinationen

Kombinationsbildung nach DIN EN 1990
Darstellung der maßgebenden Kombinationen

	Ek	(* *EW)
ständig/vorüberg.	5	1.35*Gk +1.50*Qk. N +1.50*Qk. S (1, 2)
quasi-ständig	15	1.00*Gk +0.80*Qk. N (1)
	16	1.00*Gk +0.80*Qk. N (2)

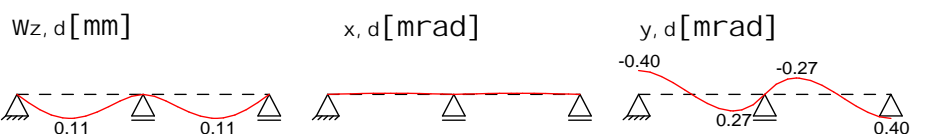
Bem.-verformungen

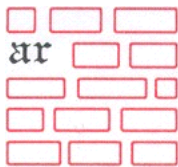
Bemessungsverformungen

Grafik

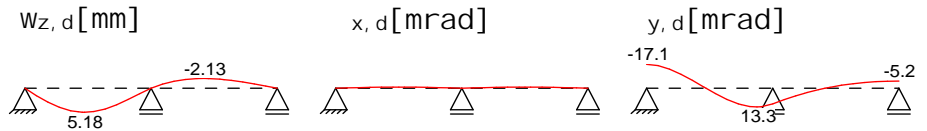
Verformungen (je Kombination)

Komb. 14

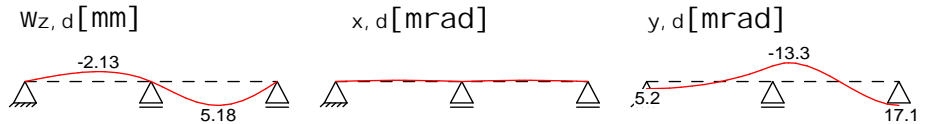




Komb. 15



Komb. 16



Tabelle

Verformungen (je Kombination)

Komb.	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
14	1	0.00	0.00	-0.40*	0.00
		0.44	0.11*	0.00	0.00
		0.52	0.10	0.10	0.00
		1.04	0.00	0.00	0.00
		2	0.00	0.00	0.00
15	1	0.00	0.00	-17.08*	0.00
		0.49	5.18*	0.05	0.00
		0.52	5.13	1.45	0.00
		0.91	1.64	13.32*	0.00
		1.04	0.00	11.12	0.00
	2	0.00	0.00	11.12	0.00
		0.44	-2.13*	-0.15	0.00
16	1	0.00	0.00	5.16	0.00
		0.52	-2.05	1.45	0.00
		0.60	-2.13*	0.15	0.00
	2	1.04	0.00	-11.12	0.00
		0.00	0.00	-11.12	0.00
		0.13	1.64	-13.32*	0.00
		0.55	5.18*	-0.05	0.00
		1.04	0.00	17.08*	0.00

Mat. / Querschnitt

Material - und Querschnittswerte

Aluminium

Material	t _{Max} [mm]	f _o [N/mm²]	E [N/mm²]	BC
EN-AW 6063, T66, EP	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

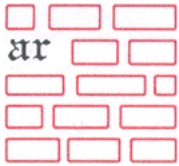
QS Profil	A [cm²]	S _y [cm³]	I _y [cm⁴]	W _y [cm³]
1 AVADI ELE13 H13mm	6.0	1.4	1.5	2.3
		12.7	141.6	16.0

Hauptachsen

QS Profil	[°]	I _{yz} [cm⁴]	I [cm⁴]	I [cm⁴]
1 AVADI ELE13 H13mm	88.10	-4.7	141.8	1.4

Torsion

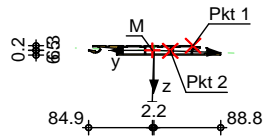
QS Profil	I _t [cm⁴]	I [cm⁶]
1 AVADI ELE13 H13mm	3.7	0.0



Grafik

Querschnittsgrafik [mm]

M 1:10



Auflagerkräfte

Charakteristische Auflagerkräfte (gl obal)

Char. Auflagerkr.

	Aufl.	M_x, k, min	F_z, k, min	F_y, k, min
		M_x, k, max [kNm]	F_z, k, max [kN]	F_y, k, max [kN]
Ei nw. <i>Gk</i>	A	0.00	0.01	0.00
	B	0.00	0.01	0.00
	C	0.00	0.02	0.00
		0.00	0.02	0.00
Ei nw. <i>Qk. N</i>	A	0.00	-0.04	0.00
	B	0.00	0.26	0.00
	C	0.00	0.37	0.00
		0.00	0.74	0.00
Ei nw. <i>Qk. S</i>	A	0.00	-0.04	0.00
	B	0.00	0.26	0.00
	C	0.00	0.04	0.00
		0.00	0.04	0.00

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E [-]
OK 0.50

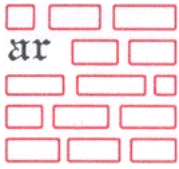
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung [-]
OK 1.00

Die Auflager Spannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!



Pos. AL1-4-3-Feld Alu Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 7 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:160



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1-3	0.88	0.0	frei

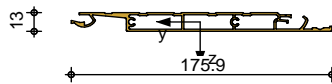
Feld	Material	Profil
1-3	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest
	B	0.88	fest	frei	fest	frei	fest
	C	1.76	fest	frei	fest	frei	fest
	D	2.64	fest	frei	fest	frei	fest

Lager	b [cm]
A, B, C, D	5.0

Grafik Querschnittsgrafik

M 1:5

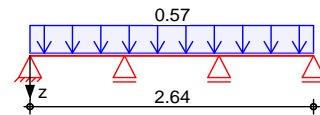
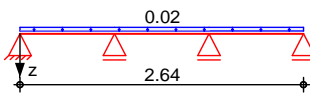


Belastungen Belastungen auf das System

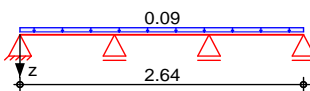
Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen

Gk Qk.N



Qk.S

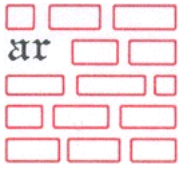


Streckenlasten in z-Richtung

Gleichlasten Feld Komm.

Einw. Gk

		a [m]	s [m]	q _{li} [kN/m]	q _{re} [kN/m]	e [cm]
1	Eigengew	0.00	0.88		0.02	-0.2
2	Eigengew	0.00	0.88		0.02	-0.2
3	Eigengew	0.00	0.88		0.02	-0.2



Ei nw. Qk. N
Ei nw. Qk. S

1	p+s	0.00	2.64	0.57	0.0
1	p+s	0.00	2.64	0.09	0.0

Char. Schni ttgrößen

charakteri stische Schni ttgrößen und Verformungen

Grafi k

Schni ttgrößen und Verformungen (j e Ei nwi rkung)

Ei nw. Gk

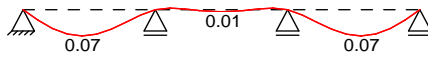
Moment $M_y, k [kNm]$

Querkraft $V_z, k [kN]$

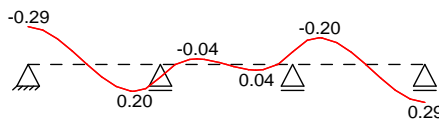


Verschi ebung $w_z, k [mm]$

Verdrehung $\alpha_x, k [mrad]$



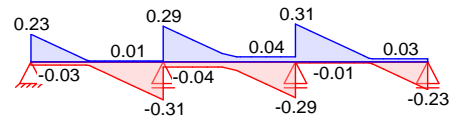
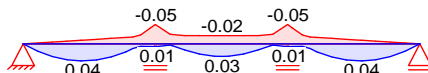
Verdrehung $\alpha_y, k [mrad]$



Ei nw. Qk. N

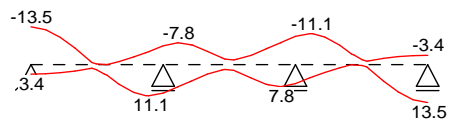
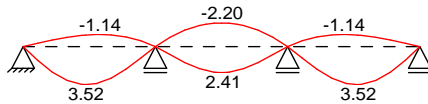
Moment $M_y, k [kNm]$

Querkraft $V_z, k [kN]$



Verschi ebung $w_z, k [mm]$

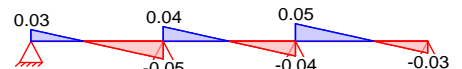
Verdrehung $\alpha_y, k [mrad]$



Ei nw. Qk. S

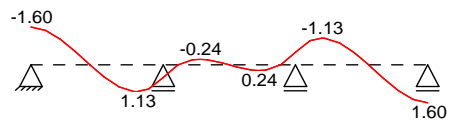
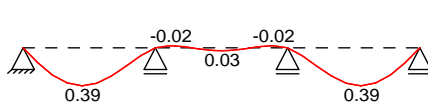
Moment $M_y, k [kNm]$

Querkraft $V_z, k [kN]$



Verschi ebung $w_z, k [mm]$

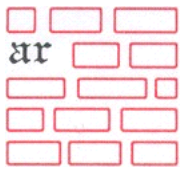
Verdrehung $\alpha_y, k [mrad]$



Tabel l e

Schni ttgrößen (j e Ei nwi rkung)

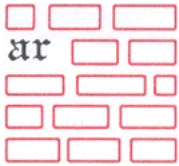
Fel d	x [m]	$M_y, k, mi n [kNm]$	$M_y, k, max [kNm]$	$V_z, k, mi n [kN]$	$V_z, k, max [kN]$
Ei nw. Gk	1	0.00	0.00	0.01	0.01
	0.35	0.00	0.00	0.00	0.00
	0.88	0.00	0.00	-0.01*	-0.01
Ei nw. Qk. N	2	0.00	0.00	0.01	0.01
	0.88	0.00	0.00	-0.01	-0.01
	3	0.00	0.00	0.01	0.01*
Ei nw. Qk. S	0.88	0.00	0.00	-0.01	-0.01
	1	0.00	0.00	-0.03	0.23
	0.39	-0.01	0.04*	-0.03	0.01
	0.88	-0.05*	0.01	-0.31*	0.01



Ei nw. Qk. S	2	0.00	-0.05	0.01	-0.04	0.29	
		0.88	-0.05	0.01	-0.29	0.04	
	3	0.00	-0.05	0.01	-0.01	0.31*	
		0.88	0.00	0.00	-0.23	0.03	
	1	0.00	0.00	0.00	0.03	0.03	
		0.35	0.01	0.01*	0.00	0.00	
	2	0.88	-0.01*	-0.01	-0.05*	-0.05	
		0.00	-0.01	-0.01	0.04	0.04	
	3	0.88	-0.01	-0.01	-0.04	-0.04	
		0.00	-0.01	-0.01	0.05	0.05*	
			0.88	0.00	0.00	-0.03	-0.03

Verformungen (j e Ei nwi rkung)

Ei nw.	Feld	x [m]	Wz, k, mi n	y, k, mi n	x, k, mi n
			Wz, k, max [mm]	y, k, max [mrad]	x, k, max [mrad]
Ei nw. Gk	1	0.00	0.00	-0.29*	0.00
		0.39	0.07*	0.00	0.00
	2	0.44	0.07	0.05	0.00
		0.88	0.07	0.05	0.00
	3	0.00	0.00	0.10	0.00
		0.10	0.00	0.10	0.00
	1	0.88	0.00	0.10	0.00
		0.00	0.00	0.10	0.00
	2	0.10	0.00	0.00	0.00
		0.88	0.00	0.00	0.00
	3	0.00	0.00	-0.10	0.00
		0.88	0.00	-0.10	0.00
Ei nw. Qk. N	1	0.00	0.00	-0.29*	0.00
		0.41	0.07*	-0.29	0.00
	2	0.44	0.07	0.05	0.00
		0.88	0.07	0.05	0.00
	3	0.00	0.00	0.10	0.00
		0.10	0.00	0.10	0.00
	1	0.88	0.00	0.10	0.00
		0.00	0.00	0.10	0.00
	2	0.10	0.00	0.00	0.00
		0.88	0.00	0.00	0.00
	3	0.00	0.00	-0.10	0.00
		0.88	0.00	-0.10	0.00
Ei nw. Qk. S	1	0.00	0.00	-13.47*	0.00
		0.41	0.07*	3.37	0.00
	2	0.44	0.07	-0.66	0.00
		0.88	0.07	1.37	0.00
	3	0.00	0.00	-6.74	0.00
		0.10	0.00	10.10	0.00
	1	0.88	0.00	-6.74	0.00
		0.00	0.00	10.10	0.00
	2	0.10	0.00	0.00	0.00
		0.88	0.00	0.00	0.00
	3	0.00	0.00	-10.10	0.00
		0.88	0.00	6.74	0.00
Ei nw. Qk. S	1	0.00	0.00	-10.10	0.00
		0.41	0.07*	6.74	0.00
	2	0.44	0.07	-3.37	0.00
		0.88	0.07	13.47*	0.00
	3	0.00	0.00	-1.60*	0.00
		0.10	0.00	-1.60	0.00
	1	0.88	0.00	0.00	0.00
		0.00	0.00	0.00	0.00
	2	0.10	0.00	0.00	0.00
		0.88	0.00	0.00	0.00
	3	0.00	0.00	0.53	0.00
		0.10	0.00	0.53	0.00
1	0.88	0.00	0.53	0.00	
	0.00	0.00	0.53	0.00	
2	0.10	0.00	0.00	0.00	
	0.88	0.00	0.00	0.00	
3	0.00	0.00	-0.53	0.00	
	0.88	0.00	-0.53	0.00	



3	0.00	0.00	-0.53	0.00
		0.00	-0.53	0.00
	0.88	0.00	1.60	0.00
		0.00	1.60*	0.00

Kombi nati onen

Kombi nati onsbil dung nach DIN EN 1990
Darstellung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	47	4	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
	48	5	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
	53	6	1.35*Gk	+1.50*Qk. N (2, 3)	+1.50*Qk. S
	55	8	1.35*Gk	+1.50*Qk. N (2)	+1.50*Qk. S
quasi -ständi g	22		1.00*Gk	+0.80*Qk. N (1, 3)	
	23		1.00*Gk	+0.80*Qk. N (2)	

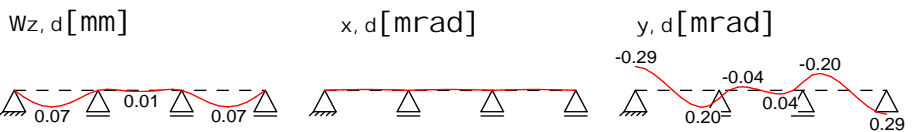
Bem. -verformungen

Bemessungsverformungen

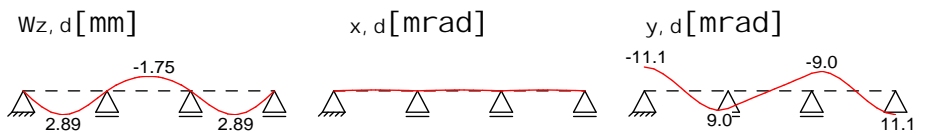
Grafi k

Verformungen (j e Kombi nati on)

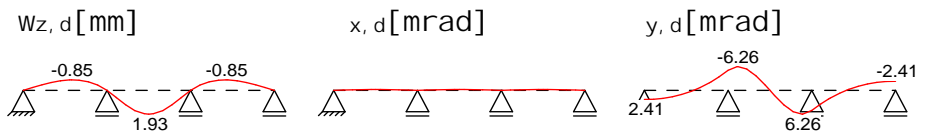
Komb. 21



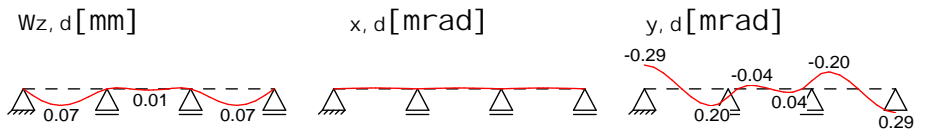
Komb. 22



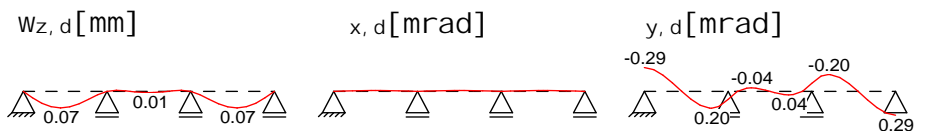
Komb. 23



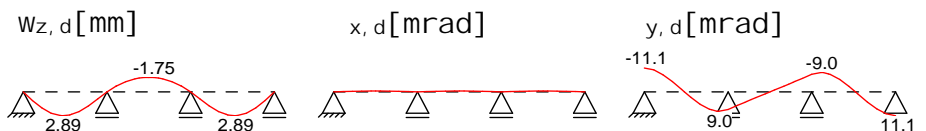
Komb. 79

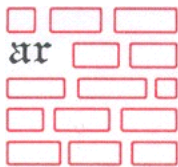


Komb. 80

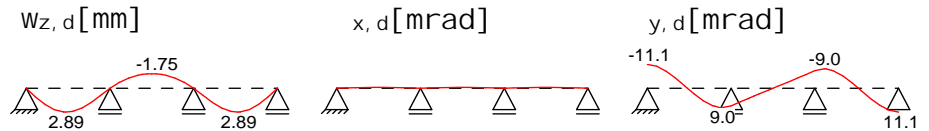


Komb. 81

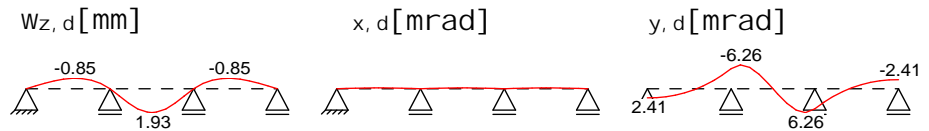




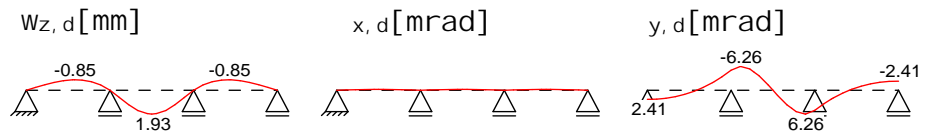
Komb. 82



Komb. 83



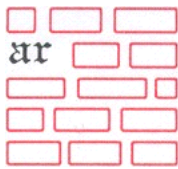
Komb. 84



Tabelle

Verformungen (je Kombination)

	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]	
Komb. 21	1	0.00	0.00	-0.29*	0.00	
		0.39	0.07*	0.00	0.00	
		0.44	0.07	0.05	0.00	
	2	0.88	0.00	0.10	0.00	
		0.10	0.00	0.00	0.00	
		0.88	0.00	-0.10	0.00	
	3	0.00	0.00	-0.10	0.00	
		0.88	0.00	0.29*	0.00	
		0.88	0.00	0.00	0.00	
Komb. 22	1	0.00	0.00	-11.07*	0.00	
		0.41	2.89*	-0.30	0.00	
		0.44	2.86	0.69	0.00	
	2	0.88	0.00	8.18	0.00	
		0.10	0.00	8.18	0.00	
		0.88	0.00	-0.10	0.00	
	3	0.00	0.00	-0.10	0.00	
		0.88	0.00	0.29*	0.00	
		0.88	0.00	11.07*	0.00	
	Komb. 23	1	0.00	0.00	2.41	0.00
			0.44	-0.81	0.69	0.00
			0.51	-0.85*	0.09	0.00
2		0.88	0.00	-5.29	0.00	
		0.10	0.00	-5.29	0.00	
		0.44	0.59	-6.26*	0.00	
3		0.78	1.93*	0.00	0.00	
		0.88	0.59	6.26*	0.00	
		0.88	0.00	5.29	0.00	
Komb. 79		1	0.00	0.00	5.29	0.00
			0.88	0.00	-2.41	0.00
			0.00	0.00	-0.29*	0.00
	2	0.39	0.07*	0.00	0.00	
		0.44	0.07	0.05	0.00	
		0.88	0.00	0.10	0.00	
	3	0.10	0.00	0.10	0.00	
		0.88	0.00	0.00	0.00	
		0.88	0.00	-0.10	0.00	
Komb. 80	1	0.00	0.00	-0.10	0.00	
		0.88	0.00	0.29*	0.00	
		0.00	0.00	-0.29*	0.00	
	2	0.39	0.07*	0.00	0.00	
		0.44	0.07	0.05	0.00	
3	0.88	0.00	0.10	0.00		
	0.88	0.00	0.10	0.00		



	2	0.00	0.00	0.10	0.00
		0.10	0.00	0.00	0.00
		0.88	0.00	-0.10	0.00
	3	0.00	0.00	-0.10	0.00
		0.88	0.00	0.29*	0.00
Komb. 81	1	0.00	0.00	-11.07*	0.00
		0.41	2.89*	-0.30	0.00
		0.44	2.86	0.69	0.00
		0.88	0.00	8.18	0.00
	2	0.00	0.00	8.18	0.00
		0.49	-1.75*	-0.88	0.00
		0.88	0.00	-8.18	0.00
	3	0.00	0.00	-8.18	0.00
		0.88	0.00	11.07*	0.00
Komb. 82	1	0.00	0.00	-11.07*	0.00
		0.41	2.89*	-0.30	0.00
		0.44	2.86	0.69	0.00
		0.88	0.00	8.18	0.00
	2	0.00	0.00	8.18	0.00
		0.49	-1.75*	-0.88	0.00
		0.88	0.00	-8.18	0.00
	3	0.00	0.00	-8.18	0.00
		0.88	0.00	11.07*	0.00
Komb. 83	1	0.00	0.00	2.41	0.00
		0.44	-0.81	0.69	0.00
		0.51	-0.85*	0.09	0.00
		0.88	0.00	-5.29	0.00
	2	0.00	0.00	-5.29	0.00
		0.10	0.59	-6.26*	0.00
		0.44	1.93*	0.00	0.00
		0.78	0.59	6.26*	0.00
		0.88	0.00	5.29	0.00
	3	0.00	0.00	5.29	0.00
		0.88	0.00	-2.41	0.00
Komb. 84	1	0.00	0.00	2.41	0.00
		0.44	-0.81	0.69	0.00
		0.51	-0.85*	0.09	0.00
		0.88	0.00	-5.29	0.00
	2	0.00	0.00	-5.29	0.00
		0.10	0.59	-6.26*	0.00
		0.44	1.93*	0.00	0.00
		0.78	0.59	6.26*	0.00
		0.88	0.00	5.29	0.00
	3	0.00	0.00	5.29	0.00
		0.88	0.00	-2.41	0.00

Mat. / Querschnitt

Material - und Querschnittswerte

Aluminium

Material

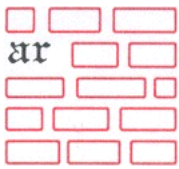
	t _{Max} [mm]	f ₀ [N/mm ²]	E [N/mm ²]	BC
<i>EN-AW 6063, T66, EP</i>	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

QS Profil

	A [cm ²]	S _y S _z [cm ³]	I _y I _z [cm ⁴]	W _y W _z [cm ³]
1 <i>AVADI ELE13 H13mm</i>	6.0	1.4 12.7	1.5 141.6	2.3 16.0



Hauptachsen

QS	Profil	$[\text{°}]$	I_{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1	AVADIELE13 H13mm	88.10	-4.7	141.8	1.4

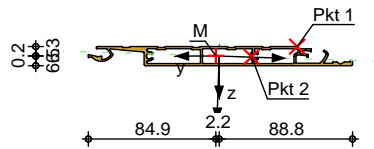
Torsion

QS	Profil	I_t [cm ⁴]	I [cm ⁶]
1	AVADIELE13 H13mm	3.7	0.0

Grafik

Querschnittsgrafik [mm]

M 1:5



Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

	Aufl.	$M_{x, k, \text{min}}$	$M_{x, k, \text{max}}$	$F_{z, k, \text{min}}$	$F_{z, k, \text{max}}$	$F_{y, k, \text{min}}$	$F_{y, k, \text{max}}$
		[kNm]		[kN]		[kN]	
Ei nw. Gk	A	0.00	0.00	0.01	0.01	0.00	0.00
	B	0.00	0.00	0.02	0.02	0.00	0.00
	C	0.00	0.00	0.02	0.02	0.00	0.00
	D	0.00	0.00	0.01	0.01	0.00	0.00
			0.00	0.00	0.01	0.01	0.00
Ei nw. Qk. N	A	0.00	0.00	-0.03	0.23	0.00	0.00
	B	0.00	0.00	-0.05	0.60	0.00	0.00
	C	0.00	0.00	-0.05	0.60	0.00	0.00
	D	0.00	0.00	-0.03	0.23	0.00	0.00
			0.00	0.00	0.23	0.23	0.00
Ei nw. Qk. S	A	0.00	0.00	0.03	0.03	0.00	0.00
	B	0.00	0.00	0.09	0.09	0.00	0.00
	C	0.00	0.00	0.09	0.09	0.00	0.00
	D	0.00	0.00	0.03	0.03	0.00	0.00
			0.00	0.00	0.03	0.03	0.00

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

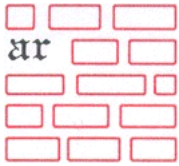
Nachweis E-E OK [-] 0.33

Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung OK [-] 0.98

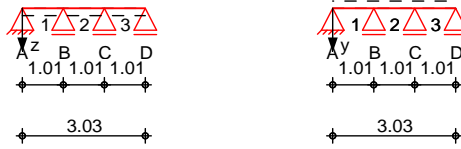


Pos. AL1-4-3-Feld-200 Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 7 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:185



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1-3	1.01	0.0	frei

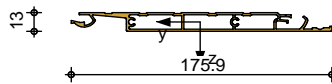
Feld	Material	Profil
1-3	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.	
							fest	frei
	A	0.00	fest	frei	fest	frei	fest	frei
	B	1.01	fest	frei	fest	frei	fest	frei
	C	2.02	fest	frei	fest	frei	fest	frei
	D	3.03	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B, C, D	5.0

Grafik Querschnittsgrafik

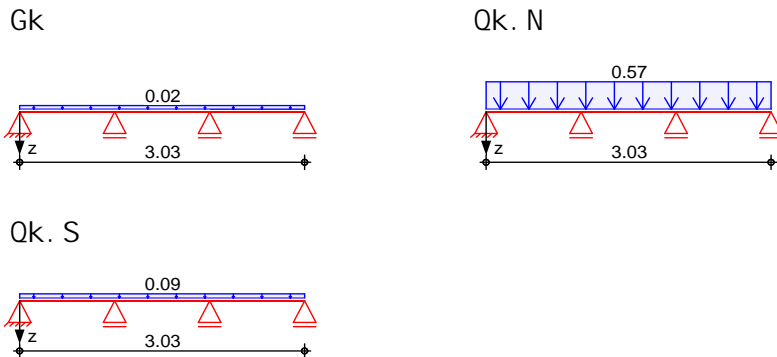
M 1:5



Belastungen Belastungen auf das System

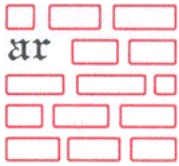
Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen



Streckenlasten in z-Richtung

Ei nw. Gk	Gleichlasten Feld Komm.	a	s	q _{li}	q _{re}	e
		[m]	[m]	[kN/m]	[kN/m]	[cm]
	1 Ei gengew	0.00	1.01		0.02	-0.2
	2 Ei gengew	0.00	1.01		0.02	-0.2
	3 Ei gengew	0.00	1.01		0.02	-0.2



Ei nw. Qk. N
Ei nw. Qk. S

1	p+s	0.00	3.03	0.57	0.0
1	p+s	0.00	3.03	0.09	0.0

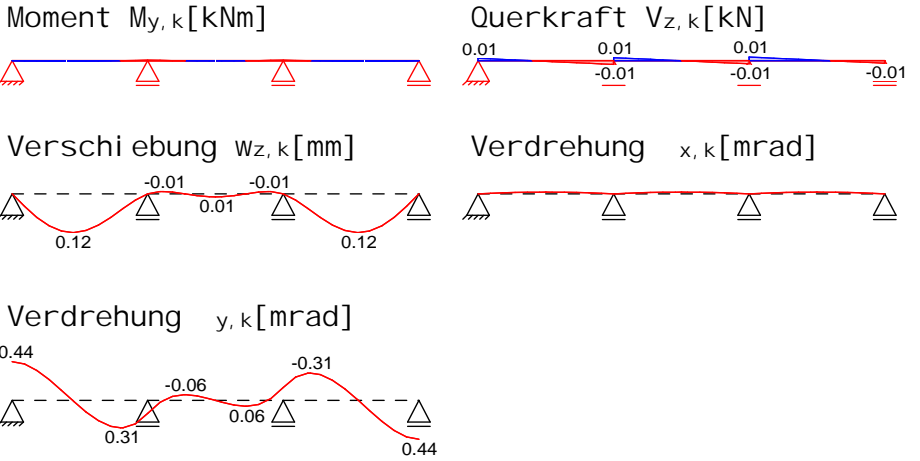
Char. Schni ttgrößen

charakteri stische Schni ttgrößen und Verformungen

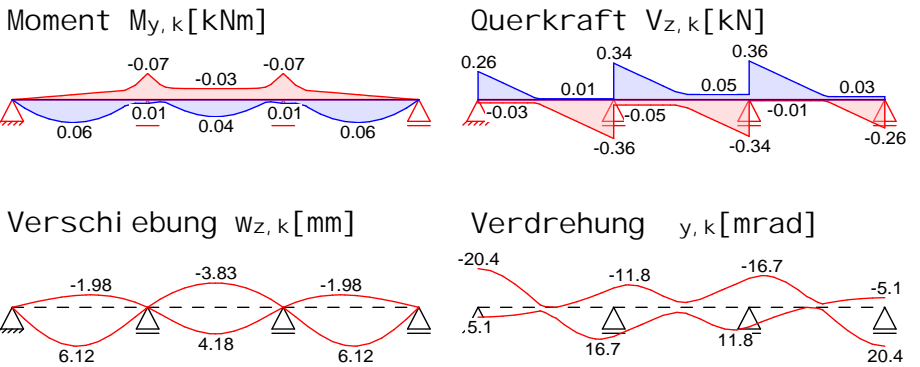
Grafi k

Schni ttgrößen und Verformungen (je Ei nwi rkung)

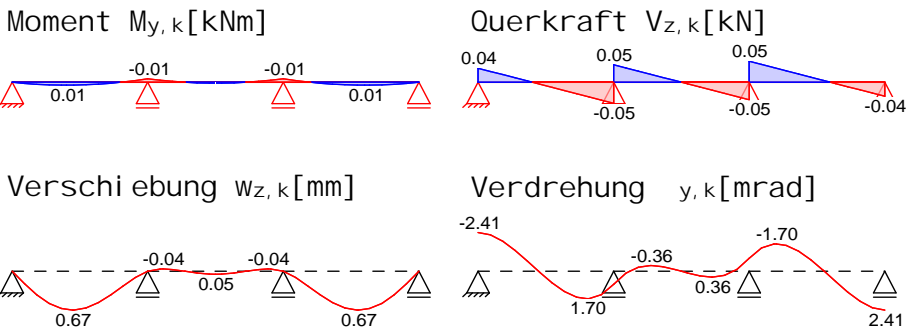
Ei nw. Gk



Ei nw. Qk. N



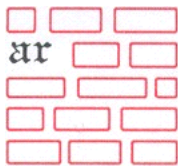
Ei nw. Qk. S



Tabel l e

Schni ttgrößen (je Ei nwi rkung)

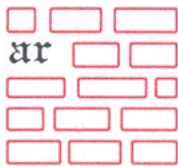
Fel d	x [m]	My, k, mi n [kNm]	My, k, max [kNm]	Vz, k, mi n [kN]	Vz, k, max [kN]
Ei nw. Gk	1	0.00	0.00	0.01	0.01
		0.40	0.00	0.00	0.00
		1.01	0.00	0.00	-0.01*
Ei nw. Qk. N	2	0.00	0.00	0.01	0.01
		1.01	0.00	0.00	-0.01
		1.01	0.00	0.00	-0.01
Ei nw. Qk. S	3	0.00	0.00	0.01	0.01*
		1.01	0.00	0.00	-0.01
	1	0.00	0.00	-0.03	0.26
	0.46	-0.01	0.06*	-0.04	0.01



Ei nw. Qk. S	2	1. 01	-0.07*	0.01	-0.36*	0.01
		0.00	-0.07	0.01	-0.05	0.34
		1.01	-0.07	0.01	-0.34	0.05
		0.00	-0.07	0.01	-0.01	0.36*
		1.01	0.00	0.00	-0.26	0.03
		1	0.00	0.00	0.00	0.04
	2	0.40	0.01	0.01*	0.00	0.00
		1.01	-0.01*	-0.01	-0.05*	-0.05
		0.00	-0.01	-0.01	0.05	0.05
		1.01	-0.01	-0.01	-0.05	-0.05
		0.00	-0.01	-0.01	0.05	0.05*
		1.01	0.00	0.00	-0.04	-0.04

Verformungen (j e Ei nwi rkung)

Ei nw.	Feld	x [m]	Wz, k, mi n	y, k, mi n	x, k, mi n	
			Wz, k, max [mm]	y, k, max [mrad]	x, k, max [mrad]	
Ei nw. Gk	1	0.00	0.00	-0.44*	0.00	
		0.45	0.00	-0.44	0.00	
		0.51	0.12*	0.00	0.00	
		0.51	0.12	0.07	0.00	
		1.01	0.00	0.15	0.00	
		1.01	0.00	0.15	0.00	
	2	0.00	0.00	0.15	0.00	
		0.11	0.00	0.15	0.00	
		0.11	-0.01*	0.00	0.00	
		1.01	-0.01	0.00	0.00	
		1.01	0.00	-0.15	0.00	
		1.01	0.00	-0.15	0.00	
Ei nw. Qk. N	3	0.00	0.00	-0.15	0.00	
		0.00	0.00	-0.15	0.00	
		1.01	0.00	0.44	0.00	
		1.01	0.00	0.44*	0.00	
		1	0.00	0.00	-20.37*	0.00
		1.01	0.00	5.09	0.00	
	2	0.00	0.00	-10.18	0.00	
		0.00	0.00	15.28	0.00	
		0.55	0.00	-10.18	0.00	
		0.55	-3.83*	15.28	0.00	
		0.55	-2.76	-2.76	0.00	
		0.55	4.13	3.45	0.00	
3	0.00	0.00	-15.28	0.00		
	0.00	0.00	10.18	0.00		
	0.00	0.00	-15.28	0.00		
	0.54	0.00	10.18	0.00		
	0.54	-1.87	-2.11	0.00		
	0.54	6.12*	1.00	0.00		
Ei nw. Qk. S	1	0.00	0.00	-5.09	0.00	
		0.00	0.00	20.37*	0.00	
		0.00	0.00	-2.41*	0.00	
		0.45	0.00	-2.41	0.00	
		0.45	0.67	0.00	0.00	
		0.45	0.67*	0.00	0.00	
	2	0.00	0.00	0.80	0.00	
		0.00	0.00	0.80	0.00	
		0.00	0.00	0.80	0.00	
		0.11	0.00	0.80	0.00	
		0.11	-0.04*	0.03	0.00	
		0.11	-0.04	0.03	0.00	
1.01	0.00	-0.80	0.00			



		0.00	-0.80	0.00
3	0.00	0.00	-0.80	0.00
		0.00	-0.80	0.00
	1.01	0.00	2.41	0.00
		0.00	2.41*	0.00

Kombi nati onen

Kombi nati onsbi ldu ng nach DIN EN 1990
Darstel lung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	47	4	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
	48	5	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
	53	6	1.35*Gk	+1.50*Qk. N (2, 3)	+1.50*Qk. S
	55	8	1.35*Gk	+1.50*Qk. N (2)	+1.50*Qk. S
quasi -ständi g	22		1.00*Gk	+0.80*Qk. N (1, 3)	
	23		1.00*Gk	+0.80*Qk. N (2)	

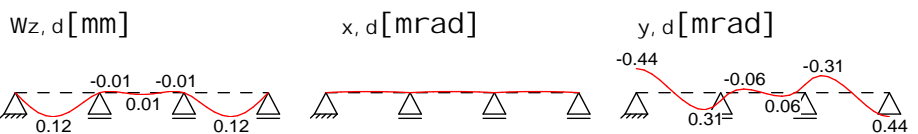
Bem. -verformungen

Bemessungsverformungen

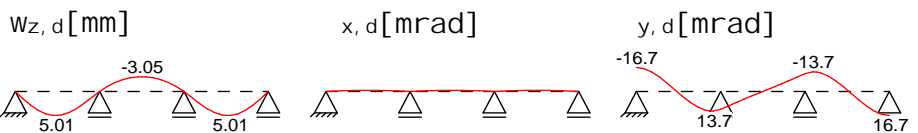
Grafi k

Verformungen (j e Kombi nati on)

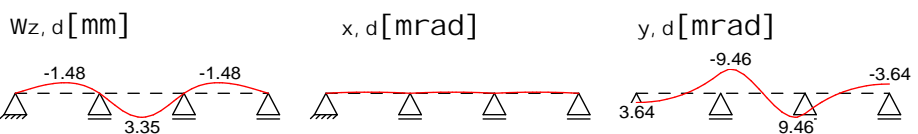
Komb. 21



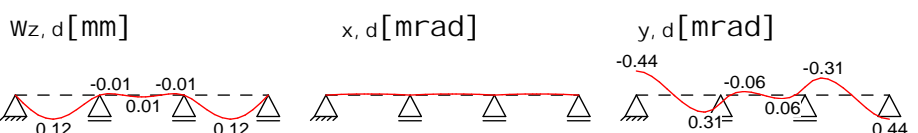
Komb. 22



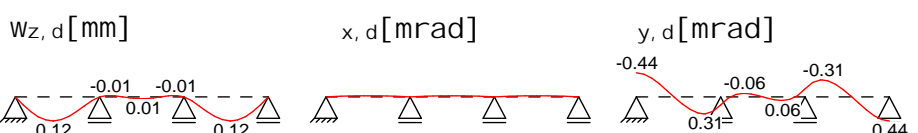
Komb. 23



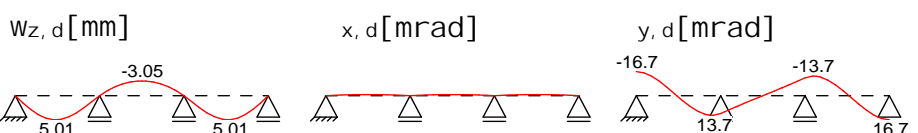
Komb. 79

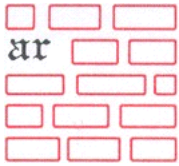


Komb. 80

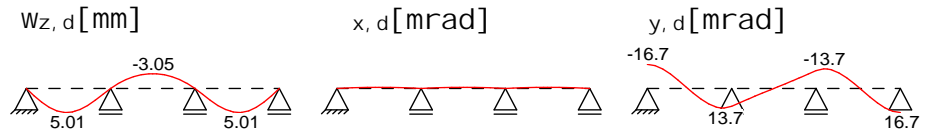


Komb. 81

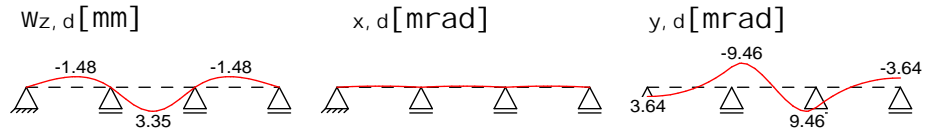




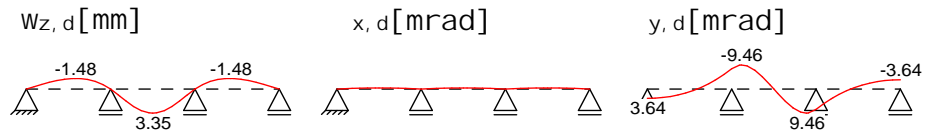
Komb. 82



Komb. 83



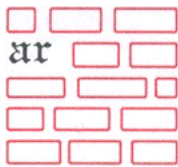
Komb. 84



Tabelle

Verformungen (je Kombination)

	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 21	1	0.00	0.00	-0.44*	0.00
		0.45	0.12*	0.00	0.00
		0.51	0.12	0.07	0.00
		1.01	0.00	0.15	0.00
	2	0.00	0.00	0.15	0.00
		0.11	-0.01*	0.00	0.00
		1.01	0.00	-0.15	0.00
		1.01	0.00	-0.15	0.00
	Komb. 22	1	0.00	0.00	-16.73*
0.47			5.01*	-0.44	0.00
0.51			4.97	1.06	0.00
1.01			0.00	12.37	0.00
2		0.00	0.00	12.37	0.00
		0.55	-3.05*	-1.09	0.00
		1.01	0.00	-12.37	0.00
		1.01	0.00	-12.37	0.00
Komb. 23		1	0.00	0.00	16.73*
	0.51		-1.41	1.06	0.00
	0.58		-1.48*	0.14	0.00
	1.01		0.00	-8.00	0.00
	2	0.00	0.00	-8.00	0.00
		0.11	1.02	-9.46*	0.00
		0.51	3.35*	0.00	0.00
		0.90	1.02	9.46*	0.00
	3	1.01	0.00	8.00	0.00
0.00		0.00	8.00	0.00	
1.01		0.00	-3.64	0.00	
1.01		0.00	-3.64	0.00	
Komb. 79	1	0.00	0.00	-0.44*	0.00
		0.45	0.12*	0.00	0.00
		0.51	0.12	0.07	0.00
		1.01	0.00	0.15	0.00
	2	0.00	0.00	0.15	0.00
		0.11	-0.01*	0.00	0.00
		1.01	0.00	-0.15	0.00
		1.01	0.00	-0.15	0.00
	3	0.00	0.00	-0.15	0.00
1.01		0.00	0.44*	0.00	
1.01		0.00	0.44*	0.00	
1.01		0.00	0.44*	0.00	
Komb. 80	1	0.00	0.00	-0.44*	0.00
		0.45	0.12*	0.00	0.00
		0.51	0.12	0.07	0.00
		1.01	0.00	0.15	0.00



	2	0.00	0.00	0.15	0.00
		0.11	-0.01*	0.00	0.00
		1.01	0.00	-0.15	0.00
	3	0.00	0.00	-0.15	0.00
		1.01	0.00	0.44*	0.00
Komb. 81	1	0.00	0.00	-16.73*	0.00
		0.47	5.01*	-0.44	0.00
		0.51	4.97	1.06	0.00
		1.01	0.00	12.37	0.00
	2	0.00	0.00	12.37	0.00
		0.55	-3.05*	-1.09	0.00
		1.01	0.00	-12.37	0.00
	3	0.00	0.00	-12.37	0.00
		1.01	0.00	16.73*	0.00
Komb. 82	1	0.00	0.00	-16.73*	0.00
		0.47	5.01*	-0.44	0.00
		0.51	4.97	1.06	0.00
		1.01	0.00	12.37	0.00
	2	0.00	0.00	12.37	0.00
		0.55	-3.05*	-1.09	0.00
		1.01	0.00	-12.37	0.00
	3	0.00	0.00	-12.37	0.00
		1.01	0.00	16.73*	0.00
Komb. 83	1	0.00	0.00	3.64	0.00
		0.51	-1.41	1.06	0.00
		0.58	-1.48*	0.14	0.00
		1.01	0.00	-8.00	0.00
	2	0.00	0.00	-8.00	0.00
		0.11	1.02	-9.46*	0.00
		0.51	3.35*	0.00	0.00
		0.90	1.02	9.46*	0.00
		1.01	0.00	8.00	0.00
	3	0.00	0.00	8.00	0.00
		1.01	0.00	-3.64	0.00
Komb. 84	1	0.00	0.00	3.64	0.00
		0.51	-1.41	1.06	0.00
		0.58	-1.48*	0.14	0.00
		1.01	0.00	-8.00	0.00
	2	0.00	0.00	-8.00	0.00
		0.11	1.02	-9.46*	0.00
		0.51	3.35*	0.00	0.00
		0.90	1.02	9.46*	0.00
		1.01	0.00	8.00	0.00
	3	0.00	0.00	8.00	0.00
		1.01	0.00	-3.64	0.00

Mat. / Querschnitt

Material - und Querschnittswerte

Aluminium

Material

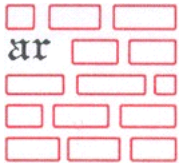
	t _{Max} [mm]	f ₀ [N/mm ²]	E [N/mm ²]	BC
<i>EN-AW 6063, T66, EP</i>	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

QS Profil

	A [cm ²]	S _y S _z [cm ³]	I _y I _z [cm ⁴]	W _y W _z [cm ³]
1 <i>AVADI ELE13 H13mm</i>	6.0	1.4 12.7	1.5 141.6	2.3 16.0



Hauptachsen

QS	Profil	$[\text{°}]$	I_{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1	AVADIELE13 H13mm	88.10	-4.7	141.8	1.4

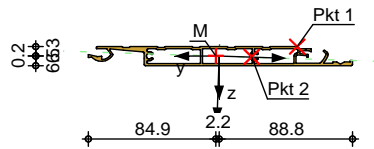
Torsion

QS	Profil	I_t [cm ⁴]	I [cm ⁶]
1	AVADIELE13 H13mm	3.7	0.0

Grafik

Querschnittsgrafik [mm]

M 1:5



Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

	Aufl.	$M_{x, k, \text{min}}$	$M_{x, k, \text{max}}$	$F_{z, k, \text{min}}$	$F_{z, k, \text{max}}$	$F_{y, k, \text{min}}$	$F_{y, k, \text{max}}$
		[kNm]		[kN]		[kN]	
Ei.nw. Gk	A	0.00	0.00	0.01	0.01	0.00	0.00
	B	0.00	0.00	0.02	0.02	0.00	0.00
	C	0.00	0.00	0.02	0.02	0.00	0.00
	D	0.00	0.00	0.01	0.01	0.00	0.00
			0.00	0.00	0.01	0.01	0.00
Ei.nw. Qk.N	A	0.00	0.00	-0.03	0.26	0.00	0.00
	B	0.00	0.00	-0.06	0.69	0.00	0.00
	C	0.00	0.00	-0.06	0.69	0.00	0.00
	D	0.00	0.00	-0.03	0.26	0.00	0.00
			0.00	0.00	0.26	0.26	0.00
Ei.nw. Qk.S	A	0.00	0.00	0.04	0.04	0.00	0.00
	B	0.00	0.00	0.10	0.10	0.00	0.00
	C	0.00	0.00	0.10	0.10	0.00	0.00
	D	0.00	0.00	0.04	0.04	0.00	0.00
			0.00	0.00	0.04	0.04	0.00

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

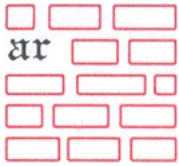
Nachweis E-E [-]
OK 0.43

Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

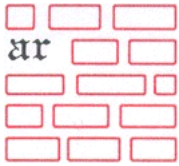
Verformung [-]
OK 0.99



PROJEKT **19259-1 Aludiele 2019 AVA**
POSITION **AL1-4-3-Feld-200 Alu Bpr. (Verkehrslastansatz 14.0 kN/m²)**

SEITE **50**
PROJ.-NR. **19259_1**
Datum **19.03.2019**

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!

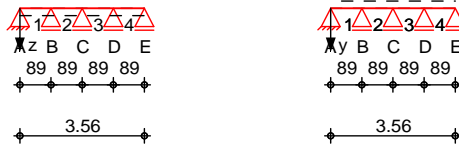


Pos. AL1-4-4-Feld Alu Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 7 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:215



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1-4	0.89	0.0	frei

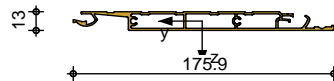
Feld	Material	Profil
1-4	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l.	Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest	frei
	B	0.89	fest	frei	fest	frei	fest	frei
	C	1.78	fest	frei	fest	frei	fest	frei
	D	2.67	fest	frei	fest	frei	fest	frei
	E	3.56	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B, C, D, E	5.0

Grafik Querschnittsgrafik

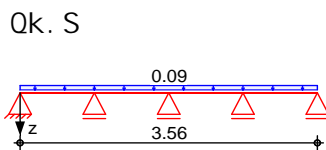
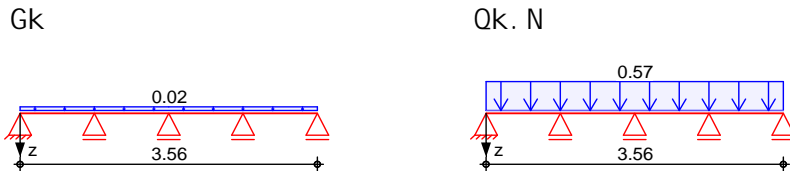
M 1:5

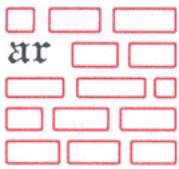


Belastungen Belastungen auf das System

Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen





Streckenlasten
in z-Richtung

Gleichlasten
Feld Komm.

Ei nw. *Gk*

			a [m]	s [m]	Q _{li} [kN/m]	Q _{re} [kN/m]	e [cm]
Ei nw. <i>Gk</i>	1	Ei gengew	0.00	0.89		0.02	-0.2
	2	Ei gengew	0.00	0.89		0.02	-0.2
	3	Ei gengew	0.00	0.89		0.02	-0.2
	4	Ei gengew	0.00	0.89		0.02	-0.2
Ei nw. <i>Qk. N</i>	1	p+s	0.00	3.56		0.57	0.0
	1	p+s	0.00	3.56		0.09	0.0

Char. Schnittgrößen

charakteristische Schnittgrößen und Verformungen

Grafik

Schnittgrößen und Verformungen (je Einwirkung)

Ei nw. *Gk*

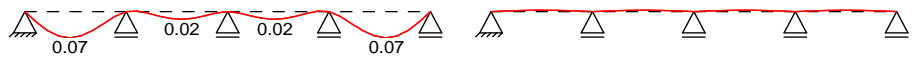
Moment $M_{y,k}$ [kNm]

Querkraft $V_{z,k}$ [kN]

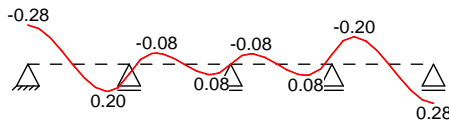


Verschiebung $w_{z,k}$ [mm]

Verdrehung χ_k [mrad]



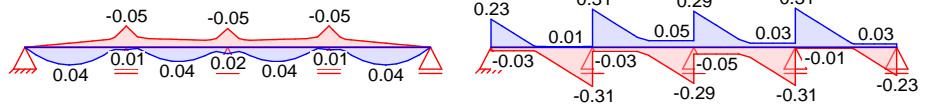
Verdrehung γ_k [mrad]



Ei nw. *Qk. N*

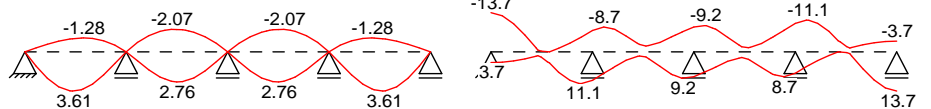
Moment $M_{y,k}$ [kNm]

Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]

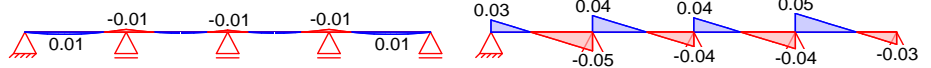
Verdrehung γ_k [mrad]



Ei nw. *Qk. S*

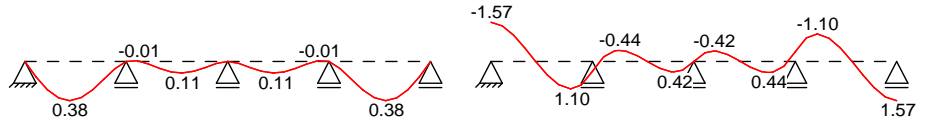
Moment $M_{y,k}$ [kNm]

Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]

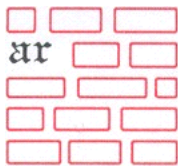
Verdrehung γ_k [mrad]



Tabelle

Schnittgrößen (je Einwirkung)

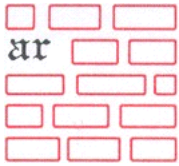
Feld	x [m]	$M_{y,k, min}$ [kNm]	$M_{y,k, max}$ [kNm]	$V_{z,k, min}$ [kN]	$V_{z,k, max}$ [kN]
Ei nw. <i>Gk</i>	1	0.00	0.00	0.01	0.01
		0.35	0.00	0.00	0.00
		0.89	0.00	0.00	-0.01*



	2	0.00	0.00	0.00	0.01	0.01
		0.89	0.00	0.00	-0.01	-0.01
	3	0.00	0.00	0.00	0.01	0.01
		0.89	0.00	0.00	-0.01	-0.01
	4	0.00	0.00	0.00	0.01	0.01*
		0.89	0.00	0.00	-0.01	-0.01
Ei nw. Qk. N	1	0.00	0.00	0.00	-0.03	0.23
		0.40	-0.01	0.04*	-0.03	0.01
		0.89	-0.05*	0.01	-0.31*	0.01
	2	0.00	-0.05	0.01	-0.03	0.31
		0.89	-0.05	0.02	-0.29	0.05
	3	0.00	-0.05	0.02	-0.05	0.29
		0.89	-0.05	0.01	-0.31	0.03
	4	0.00	-0.05	0.01	-0.01	0.31*
		0.89	0.00	0.00	-0.23	0.03
Ei nw. Qk. S	1	0.00	0.00	0.00	0.03	0.03
		0.35	0.01	0.01*	0.00	0.00
		0.89	-0.01*	-0.01	-0.05*	-0.05
	2	0.00	-0.01	-0.01	0.04	0.04
		0.89	-0.01	-0.01	-0.04	-0.04
	3	0.00	-0.01	-0.01	0.04	0.04
		0.89	-0.01	-0.01	-0.04	-0.04
	4	0.00	-0.01	-0.01	0.05	0.05*
		0.89	0.00	0.00	-0.03	-0.03

Verformungen (j e Ei nwi rkung)

Fel d	x	Wz, k, mi n		y, k, mi n		x, k, mi n			
		Wz, k, max		y, k, max		x, k, max			
	[m]	[mm]		[mrad]		[mrad]			
Ei nw. Gk	1	0.00	0.00	-0.28*	0.00	0.00	0.00		
			0.39	0.07	-0.28	0.00	0.00	0.00	
				0.07*	0.00	0.00	0.00	0.00	
			0.45	0.07	0.05	0.00	0.00	0.00	
				0.07	0.05	0.00	0.00	0.00	
			0.89	0.00	0.07	0.00	0.00	0.00	
	2	0.00	0.00	0.00	0.07	0.00	0.00	0.00	
				0.10	0.00	0.07	0.00	0.00	0.00
					0.00	-0.03	0.00	0.00	0.00
				0.89	0.00	-0.03	0.00	0.00	0.00
					0.00	0.00	0.00	0.00	0.00
				0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
			0.89	0.00	0.00	0.00	0.00	0.00	
				0.00	-0.07	0.00	0.00	0.00	
			0.00	0.00	-0.07	0.00	0.00	0.00	
				0.00	-0.07	0.00	0.00	0.00	
			0.89	0.00	-0.07	0.00	0.00	0.00	
4	0.00	0.00	0.00	-0.07	0.00	0.00	0.00		
			0.89	0.00	-0.07	0.00	0.00	0.00	
				0.00	0.28	0.00	0.00	0.00	
			0.00	0.00	0.28*	0.00	0.00	0.00	
				0.00	0.00	0.00	0.00	0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	
Ei nw. Qk. N	1	0.00	0.00	-13.69*	0.00	0.00	0.00		
			0.42	0.00	3.73	0.00	0.00		
				-1.21	-0.56	0.00	0.00		
				3.61*	1.46	0.00	0.00		
			0.89	0.00	-7.47	0.00	0.00		
				0.00	9.96	0.00	0.00		
	2	0.00	0.00	0.00	-7.47	0.00	0.00		
					0.00	9.96	0.00	0.00	
				0.89	0.00	-8.71	0.00	0.00	
					0.00	8.71	0.00	0.00	
				0.00	0.00	-8.71	0.00	0.00	
					0.00	8.71	0.00	0.00	
3	0.00	0.00	0.00	-8.71	0.00	0.00			
				0.00	8.71	0.00	0.00		
			0.00	0.00	0.00	0.00	0.00		
				0.00	0.00	0.00	0.00		
			0.00	0.00	0.00	0.00	0.00		
				0.00	0.00	0.00	0.00		



		0.00	8.71	0.00
	0.49	-2.07*	-1.59	0.00
		2.71	3.01	0.00
	0.89	0.00	-9.96	0.00
		0.00	7.47	0.00
4	0.00	0.00	-9.96	0.00
		0.00	7.47	0.00
	0.89	0.00	-3.73	0.00
		0.00	13.69*	0.00
Ei nw. Qk. S	1	0.00	-1.57*	0.00
		0.00	-1.57	0.00
	0.39	0.38	0.00	0.00
		0.38*	0.00	0.00
	0.89	0.00	0.39	0.00
		0.00	0.39	0.00
2	0.00	0.00	0.39	0.00
		0.00	0.39	0.00
	0.10	-0.01*	-0.19	0.00
		-0.01	-0.19	0.00
	0.89	0.00	0.00	0.00
		0.00	0.00	0.00
3	0.00	0.00	0.00	0.00
		0.00	0.00	0.00
	0.89	0.00	-0.39	0.00
		0.00	-0.39	0.00
4	0.00	0.00	-0.39	0.00
		0.00	-0.39	0.00
	0.89	0.00	1.57	0.00
		0.00	1.57*	0.00

Kombi nati onen

Kombi nati onsbi ldu ng nach DIN EN 1990
 Darstel lung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	58	7	1.35*Gk	+1.50*Qk. N (1, 2, 4)	+1.50*Qk. S
	59	8	1.35*Gk	+1.50*Qk. N (1, 2, 4)	+1.50*Qk. S
	60	5	1.35*Gk	+1.50*Qk. N (1, 3, 4)	+1.50*Qk. S
	61	6	1.35*Gk	+1.50*Qk. N (1, 3, 4)	+1.50*Qk. S
quasi -ständi g	28		1.00*Gk	+0.80*Qk. N (1, 3)	
	29		1.00*Gk	+0.80*Qk. N (2, 4)	

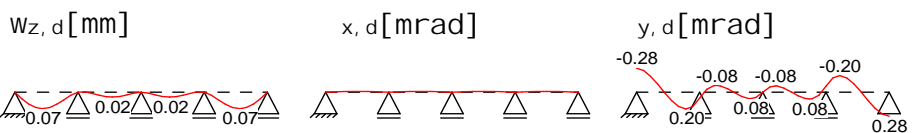
Bem. -verformungen

Bemessungsverformungen

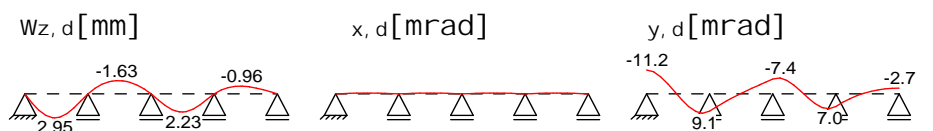
Grafi k

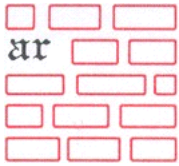
Verformungen (j e Kombi nati on)

Komb. 27

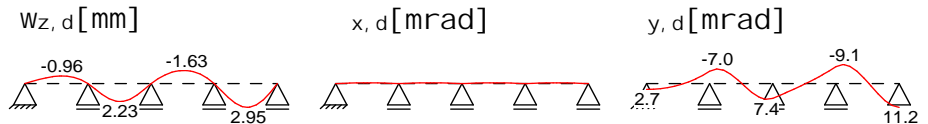


Komb. 28

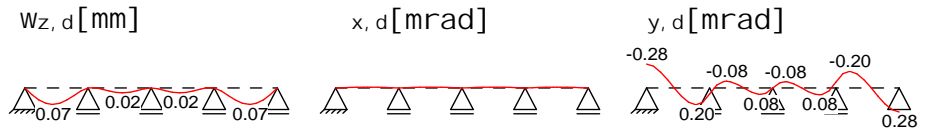




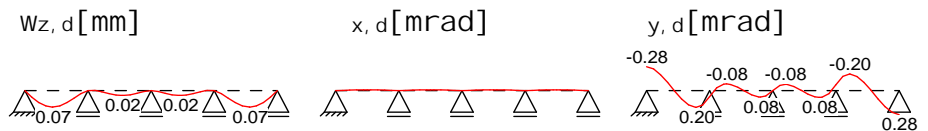
Komb. 29



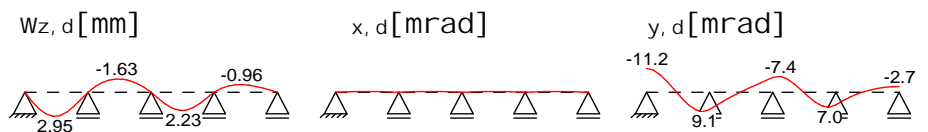
Komb. 102



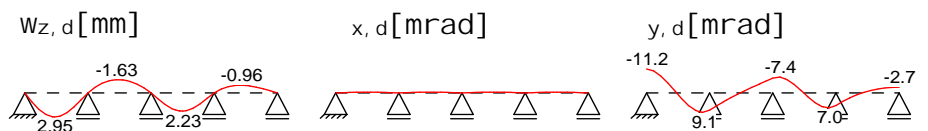
Komb. 103



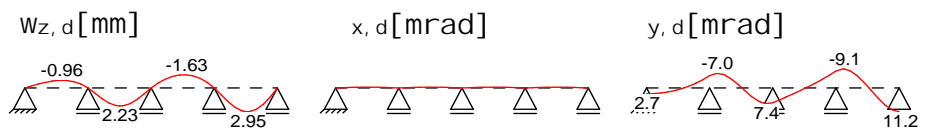
Komb. 104



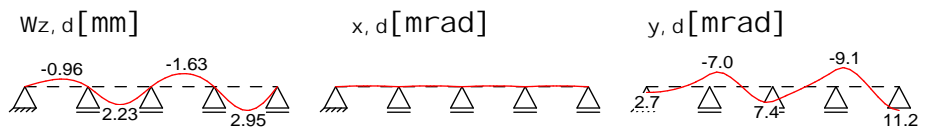
Komb. 105



Komb. 106



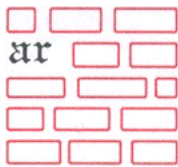
Komb. 107



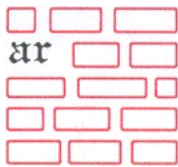
Tabelle

Verformungen (je Kombination)

Komb.	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 27	1	0.00	0.00	-0.28*	0.00
		0.39	0.07*	0.00	0.00
		0.45	0.07	0.05	0.00
		0.89	0.00	0.07	0.00
		0.00	0.00	0.07	0.00
Komb. 28	1	0.00	0.00	-11.23*	0.00
		0.42	2.95*	-0.24	0.00
		0.45	2.92	0.77	0.00
Komb. 28	2	0.79	0.86	9.06*	0.00
		0.89	0.00	8.04	0.00
		0.00	0.00	8.04	0.00
		0.40	-1.63*	0.55	0.00
		0.00	0.00	0.00	0.00



PROJEKT	19259-1Aludiele 2019 AVA		PROJ.-NR.	19259_1	
POSITION	AL1-4-4-Feld Alu Bpr. (Verkehrslastansatz 240 kN/m ²)			19.03.2019	
		0.89	0.00	-6.97	0.00
	3	0.00	0.00	-6.97	0.00
		0.89	0.00	5.90	0.00
	4	0.00	0.00	5.90	0.00
		0.89	0.00	-2.70	0.00
Komb. 29	1	0.00	0.00	2.70	0.00
		0.45	-0.92	0.77	0.00
		0.89	0.00	-5.90	0.00
	2	0.00	0.00	-5.90	0.00
		0.89	0.00	6.97	0.00
	3	0.00	0.00	6.97	0.00
		0.49	-1.63*	-0.55	0.00
		0.89	0.00	-8.04	0.00
	4	0.00	0.00	-8.04	0.00
		0.10	0.86	-9.06*	0.00
		0.47	2.95*	0.24	0.00
		0.89	0.00	11.23*	0.00
Komb. 102	1	0.00	0.00	-0.28*	0.00
		0.39	0.07*	0.00	0.00
		0.45	0.07	0.05	0.00
		0.89	0.00	0.07	0.00
	2	0.00	0.00	0.07	0.00
		0.10	0.00	-0.03	0.00
		0.89	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00
		0.89	0.00	-0.07	0.00
	4	0.00	0.00	-0.07	0.00
		0.89	0.00	0.28*	0.00
Komb. 103	1	0.00	0.00	-0.28*	0.00
		0.39	0.07*	0.00	0.00
		0.45	0.07	0.05	0.00
		0.89	0.00	0.07	0.00
	2	0.00	0.00	0.07	0.00
		0.10	0.00	-0.03	0.00
		0.89	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00
		0.89	0.00	-0.07	0.00
	4	0.00	0.00	-0.07	0.00
		0.89	0.00	0.28*	0.00
Komb. 104	1	0.00	0.00	-11.23*	0.00
		0.42	2.95*	-0.24	0.00
		0.45	2.92	0.77	0.00
		0.79	0.86	9.06*	0.00
		0.89	0.00	8.04	0.00
	2	0.00	0.00	8.04	0.00
		0.40	-1.63*	0.55	0.00
		0.89	0.00	-6.97	0.00
	3	0.00	0.00	-6.97	0.00
		0.89	0.00	5.90	0.00
	4	0.00	0.00	5.90	0.00
		0.89	0.00	-2.70	0.00
Komb. 105	1	0.00	0.00	-11.23*	0.00
		0.42	2.95*	-0.24	0.00
		0.45	2.92	0.77	0.00
		0.79	0.86	9.06*	0.00
		0.89	0.00	8.04	0.00
	2	0.00	0.00	8.04	0.00
		0.40	-1.63*	0.55	0.00
		0.89	0.00	-6.97	0.00
	3	0.00	0.00	-6.97	0.00
		0.89	0.00	5.90	0.00
	4	0.00	0.00	5.90	0.00
		0.89	0.00	-2.70	0.00
Komb. 106	1	0.00	0.00	2.70	0.00



		0.45	-0.92	0.77	0.00
		0.89	0.00	-5.90	0.00
2		0.00	0.00	-5.90	0.00
		0.89	0.00	6.97	0.00
3		0.00	0.00	6.97	0.00
		0.49	-1.63*	-0.55	0.00
		0.89	0.00	-8.04	0.00
4		0.00	0.00	-8.04	0.00
		0.10	0.86	-9.06*	0.00
		0.47	2.95*	0.24	0.00
		0.89	0.00	11.23*	0.00
Komb. 107	1	0.00	0.00	2.70	0.00
		0.45	-0.92	0.77	0.00
		0.89	0.00	-5.90	0.00
2		0.00	0.00	-5.90	0.00
		0.89	0.00	6.97	0.00
3		0.00	0.00	6.97	0.00
		0.49	-1.63*	-0.55	0.00
		0.89	0.00	-8.04	0.00
4		0.00	0.00	-8.04	0.00
		0.10	0.86	-9.06*	0.00
		0.47	2.95*	0.24	0.00
		0.89	0.00	11.23*	0.00

Mat. / Querschnitt

Material - und Querschnittswerte

Aluminium

Material

t _{Max}	f _o	E	BC
[mm]	[N/mm ²]	[N/mm ²]	

EN-AW 6063, T66, EP

10 ^b	200	70000	A
25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

QS Profil A

S _y	I _y	W _y
S _z	I _z	W _z
[cm ³]	[cm ⁴]	[cm ³]

1	AVADIELE13 H13mm	6.0	1.4	1.5	2.3
			12.7	141.6	16.0

Hauptachsen

QS Profil

I _{yz}	I	I
[cm ⁴]	[cm ⁴]	[cm ⁴]

1	AVADIELE13 H13mm	88.10	-4.7	141.8	1.4
---	------------------	-------	------	-------	-----

Torsion

QS Profil

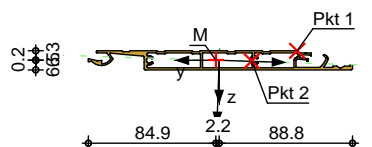
I _t	I
[cm ⁴]	[cm ⁶]

1	AVADIELE13 H13mm	3.7	0.0
---	------------------	-----	-----

Grafik

Querschnittsgrafik [mm]

M 1:5



Auflagerkräfte

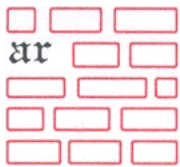
Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

Aufl.	M _{x, k, min}	F _{z, k, min}	F _{y, k, min}
	M _{x, k, max}	F _{z, k, max}	F _{y, k, max}
	[kNm]	[kN]	[kN]

Einw. GK

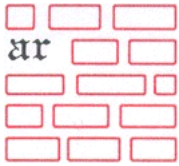
A	0.00	0.01	0.00
---	------	------	------



		0.00	0.01	0.00
	B	0.00	0.02	0.00
		0.00	0.02	0.00
	C	0.00	0.01	0.00
		0.00	0.01	0.00
	D	0.00	0.02	0.00
		0.00	0.02	0.00
	E	0.00	0.01	0.00
		0.00	0.01	0.00
Ei nw. Qk. N	A	0.00	-0.03	0.00
		0.00	0.23	0.00
	B	0.00	-0.04	0.00
		0.00	0.62	0.00
	C	0.00	-0.11	0.00
		0.00	0.58	0.00
	D	0.00	-0.04	0.00
		0.00	0.62	0.00
	E	0.00	-0.03	0.00
		0.00	0.23	0.00
Ei nw. Qk. S	A	0.00	0.03	0.00
		0.00	0.03	0.00
	B	0.00	0.09	0.00
		0.00	0.09	0.00
	C	0.00	0.07	0.00
		0.00	0.07	0.00
	D	0.00	0.09	0.00
		0.00	0.09	0.00
	E	0.00	0.03	0.00
		0.00	0.03	0.00

Zusammenfassung	Zusammenfassung der Nachwei se		
Nachwei se (GZT)	Nachwei se im Grenzzustand der Tragfähi gkei t		
	Nachwei s		
			[-]
	Nachwei s E-E	OK	0.35
Nachwei se (GZG)	Nachwei se im Grenzzust. der Gebrauchstaugl ichkei t		
	Nachwei s		
			[-]
	Verformung	OK	0.99

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
 Kürzere Spannweiten sind möglich!



Pos. AL1-4-4-Feld-200 Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 7 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1: 245



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1-4	1.01	0.0	frei

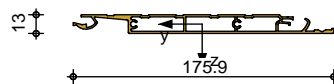
Feld	Material	Profil
1-4	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest
	B	1.01	fest	frei	fest	frei	fest
	C	2.02	fest	frei	fest	frei	fest
	D	3.03	fest	frei	fest	frei	fest
	E	4.04	fest	frei	fest	frei	fest

Lager	b [cm]
A, B, C, D, E	5.0

Grafik Querschnittsgrafik

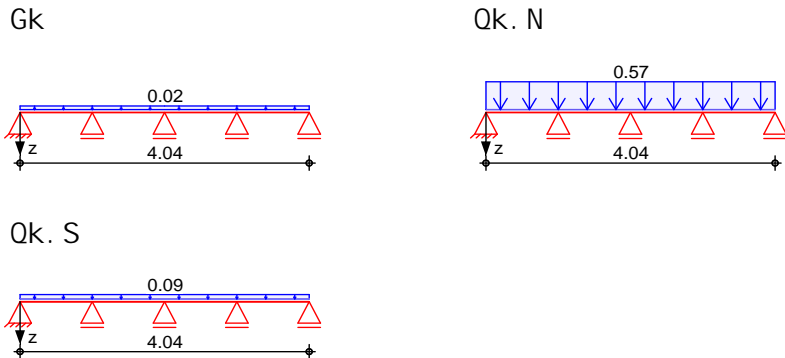
M 1: 5

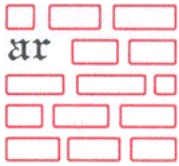


Belastungen Belastungen auf das System

Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen





Streckenlasten
in z-Richtung

Ei nw. *Gk*

Ei nw. *Qk. N*

Ei nw. *Qk. S*

Gleichlasten
Feld Komm.

			a [m]	s [m]	Q_{li} [kN/m]	Q_{re} [kN/m]	e [cm]
1	Ei gengew		0.00	1.01		0.02	-0.2
2	Ei gengew		0.00	1.01		0.02	-0.2
3	Ei gengew		0.00	1.01		0.02	-0.2
4	Ei gengew		0.00	1.01		0.02	-0.2
1	p+s		0.00	4.04		0.57	0.0
1	p+s		0.00	4.04		0.09	0.0

Char. Schnittgrößen

charakteristische Schnittgrößen und Verformungen

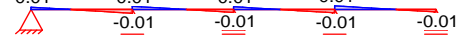
Grafik

Schnittgrößen und Verformungen (je Einwirkung)

Ei nw. *Gk*

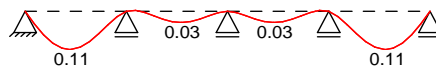
Moment M_y, k [kNm]

Querkraft V_z, k [kN]

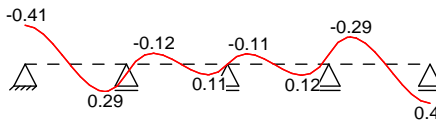


Verschiebung w_z, k [mm]

Verdrehung α_x, k [mrad]



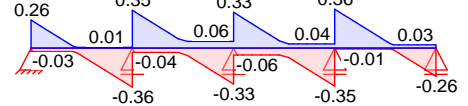
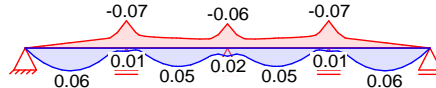
Verdrehung α_y, k [mrad]



Ei nw. *Qk. N*

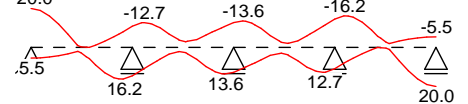
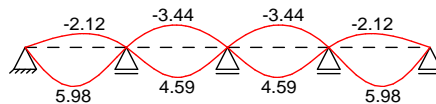
Moment M_y, k [kNm]

Querkraft V_z, k [kN]



Verschiebung w_z, k [mm]

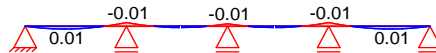
Verdrehung α_y, k [mrad]



Ei nw. *Qk. S*

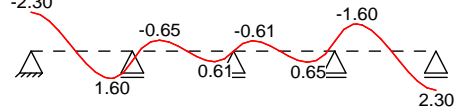
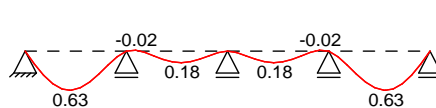
Moment M_y, k [kNm]

Querkraft V_z, k [kN]

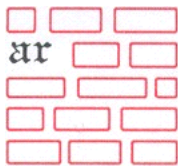


Verschiebung w_z, k [mm]

Verdrehung α_y, k [mrad]



Tabelle

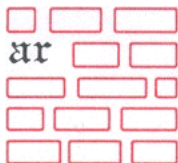


Schnittgrößen (je Einwirkung)

Einw.	Gk	Feld	x [m]	My, k, min	My, k, max	Vz, k, min	Vz, k, max		
				[kNm]	[kNm]	[kN]	[kN]		
Einw. Gk	1	1	0.00	0.00	0.00	0.01	0.01		
			0.40	0.00	0.00	0.00	0.00		
			1.01	0.00	0.00	-0.01*	-0.01		
		2	0.00	0.00	0.00	0.01	0.01		
			1.01	0.00	0.00	-0.01	-0.01		
			3	0.00	0.00	0.00	0.01	0.01	
	Einw. Qk.N	1	1	0.00	0.00	0.00	-0.03	0.26	
				0.46	-0.01	0.06*	-0.04	0.01	
				1.01	-0.07*	0.01	-0.36*	0.01	
			2	0.00	-0.07	0.01	-0.04	0.35	
				1.01	-0.06	0.02	-0.33	0.06	
				3	0.00	-0.06	0.02	-0.06	0.33
Einw. Qk.S	1	1	0.00	0.00	0.00	0.04	0.04		
			0.40	0.01	0.01*	0.00	0.00		
			1.01	-0.01*	-0.01	-0.06*	-0.06		
			2	0.00	-0.01	-0.01	0.05	0.05	
				1.01	-0.01	-0.01	-0.04	-0.04	
				3	0.00	-0.01	-0.01	0.04	0.04
		Einw. Qk.S	1	1	0.00	-0.01	-0.01	-0.05	-0.05
					0.00	-0.01	-0.01	0.06	0.06*
					1.01	0.00	0.00	-0.04	-0.04

Verformungen (je Einwirkung)

Einw.	Gk	Feld	x [m]	Wz, k, min	Wz, k, max	y, k, min	y, k, max	x, k, min	x, k, max	
				[mm]	[mm]	[mrad]	[mrad]	[mrad]	[mrad]	
Einw. Gk	1	1	0.00	0.00	0.00	-0.41*	0.00	0.00	0.00	
			0.44	0.11	0.11*	0.00	0.00	0.00		
			0.51	0.11	0.11	0.08	0.00	0.00		
			1.01	0.00	0.00	0.10	0.00	0.00		
			2	0.00	0.00	0.10	0.00	0.00		
				0.09	0.00	0.10	0.00	0.00		
		1.01		0.00	0.00	-0.03	0.00			
		3		0.00	0.00	0.00	0.00	0.00		
				1.01	0.00	0.00	0.00	0.00		
				4	0.00	0.00	0.00	0.00	0.00	
			1.01		0.00	0.00	-0.10	0.00		
			Einw. Qk.N		1	1	0.00	0.00	-20.01*	0.00
	1.01						0.00	5.46	0.00	0.00
	0.00	0.00					-10.91	0.00	0.00	
	2	0.00				0.00	14.55	0.00	0.00	



	2	0.00	0.00	-10.91	0.00
			0.00	14.55	0.00
		1.01	0.00	-12.73	0.00
			0.00	12.73	0.00
	3	0.00	0.00	-12.73	0.00
			0.00	12.73	0.00
		0.55	-3.44*	-2.22	0.00
			4.52	4.09	0.00
		1.01	0.00	-14.55	0.00
			0.00	10.91	0.00
	4	0.00	0.00	-14.55	0.00
			0.00	10.91	0.00
		0.54	-2.01	-2.17	0.00
			5.98*	0.82	0.00
		1.01	0.00	-5.46	0.00
			0.00	20.01*	0.00
Ei nw. Qk. S	1	0.00	0.00	-2.30*	0.00
			0.00	-2.30	0.00
		0.44	0.63	0.00	0.00
			0.63*	0.00	0.00
		1.01	0.00	0.57	0.00
			0.00	0.57	0.00
	2	0.00	0.00	0.57	0.00
			0.00	0.57	0.00
		0.09	-0.02*	-0.16	0.00
			-0.02	-0.16	0.00
		1.01	0.00	0.00	0.00
			0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00
			0.00	0.00	0.00
		1.01	0.00	-0.57	0.00
			0.00	-0.57	0.00
	4	0.00	0.00	-0.57	0.00
			0.00	-0.57	0.00
		1.01	0.00	2.30	0.00
			0.00	2.30*	0.00

Kombi nati onen

Kombi nati onsbil dung nach DIN EN 1990
 Darstel lung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	58	7	1.35*Gk	+1.50*Qk. N (1, 2, 4)	+1.50*Qk. S
	59	8	1.35*Gk	+1.50*Qk. N (1, 2, 4)	+1.50*Qk. S
	60	5	1.35*Gk	+1.50*Qk. N (1, 3, 4)	+1.50*Qk. S
	61	6	1.35*Gk	+1.50*Qk. N (1, 3, 4)	+1.50*Qk. S
quasi -ständi g	28		1.00*Gk	+0.80*Qk. N (1, 3)	
	29		1.00*Gk	+0.80*Qk. N (2, 4)	

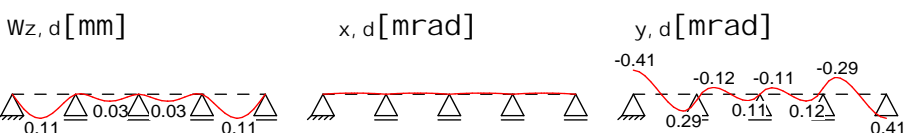
Bem. -verformungen

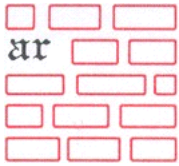
Bemessungsverformungen

Grafi k

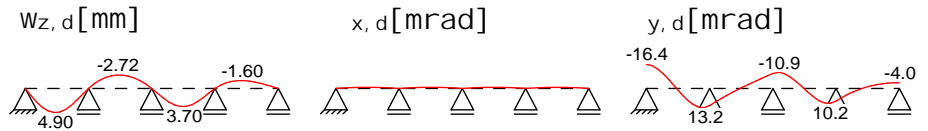
Verformungen (j e Kombi nati on)

Komb. 27

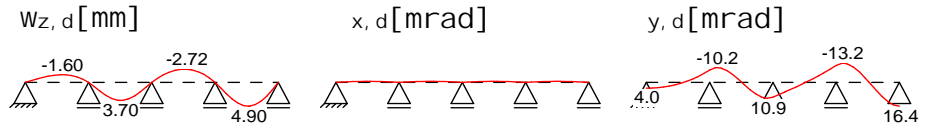




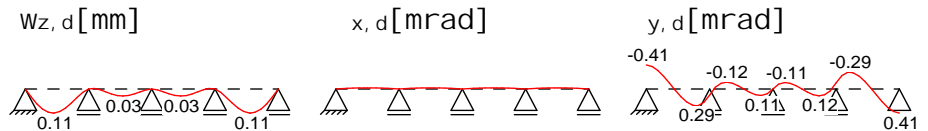
Komb. 28



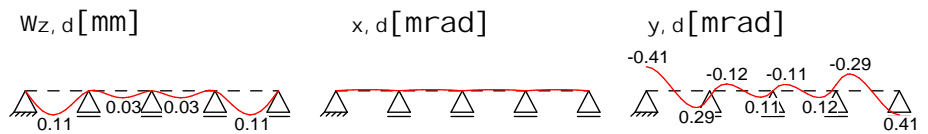
Komb. 29



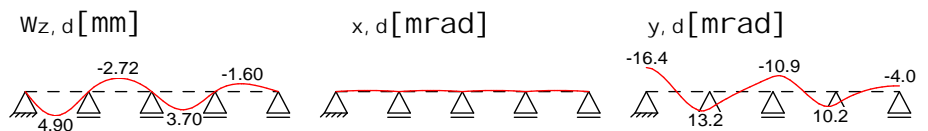
Komb. 102



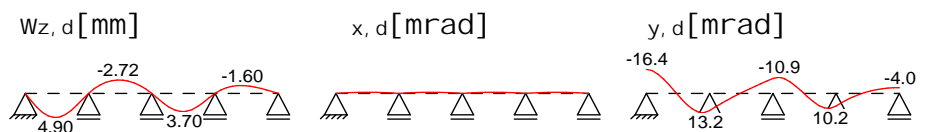
Komb. 103



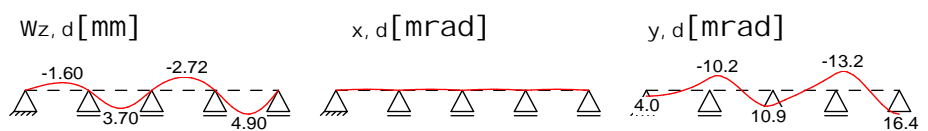
Komb. 104



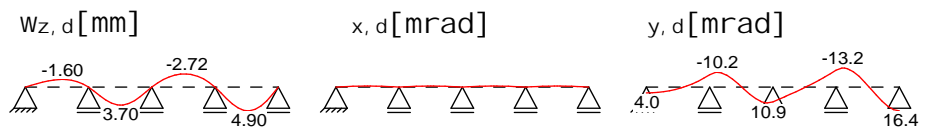
Komb. 105



Komb. 106



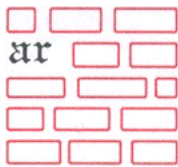
Komb. 107



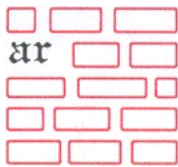
Tabelle

Verformungen (je Kombination)

Komb.	Feld	X	Wz, d	y, d	x, d
		[m]	[mm]	[mrad]	[mrad]
27	1	0.00	0.00	-0.41*	0.00
		0.44	0.11*	0.00	0.00
		0.51	0.11	0.08	0.00
		1.01	0.00	0.10	0.00
2	0	0.00	0.00	0.10	0.00
		0.09	0.00	-0.03	0.00
		1.01	0.00	0.00	0.00
3	0	0.00	0.00	0.00	0.00
		1.01	0.00	-0.10	0.00
4	0	0.00	0.00	-0.10	0.00
		1.01	0.00	0.41*	0.00
28	1	0.00	0.00	-16.42*	0.00



		0.47	4.90*	-0.34	0.00
		0.51	4.85	1.14	0.00
		0.92	1.16	13.20*	0.00
		1.01	0.00	11.74	0.00
	2	0.00	0.00	11.74	0.00
		0.46	-2.72*	0.58	0.00
		1.01	0.00	-10.18	0.00
	3	0.00	0.00	-10.18	0.00
		1.01	0.00	8.63	0.00
	4	0.00	0.00	8.63	0.00
		1.01	0.00	-3.95	0.00
Komb. 29	1	0.00	0.00	3.95	0.00
		0.51	-1.53	1.14	0.00
		1.01	0.00	-8.63	0.00
	2	0.00	0.00	-8.63	0.00
		1.01	0.00	10.18	0.00
	3	0.00	0.00	10.18	0.00
		0.55	-2.72*	-0.58	0.00
		1.01	0.00	-11.74	0.00
	4	0.00	0.00	-11.74	0.00
		0.09	1.16	-13.20*	0.00
		0.54	4.90*	0.34	0.00
		1.01	0.00	16.42*	0.00
Komb. 102	1	0.00	0.00	-0.41*	0.00
		0.44	0.11*	0.00	0.00
		0.51	0.11	0.08	0.00
		1.01	0.00	0.10	0.00
	2	0.00	0.00	0.10	0.00
		0.09	0.00	-0.03	0.00
		1.01	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00
		1.01	0.00	-0.10	0.00
	4	0.00	0.00	-0.10	0.00
		1.01	0.00	0.41*	0.00
Komb. 103	1	0.00	0.00	-0.41*	0.00
		0.44	0.11*	0.00	0.00
		0.51	0.11	0.08	0.00
		1.01	0.00	0.10	0.00
	2	0.00	0.00	0.10	0.00
		0.09	0.00	-0.03	0.00
		1.01	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00
		1.01	0.00	-0.10	0.00
	4	0.00	0.00	-0.10	0.00
		1.01	0.00	0.41*	0.00
Komb. 104	1	0.00	0.00	-16.42*	0.00
		0.47	4.90*	-0.34	0.00
		0.51	4.85	1.14	0.00
		0.92	1.16	13.20*	0.00
		1.01	0.00	11.74	0.00
	2	0.00	0.00	11.74	0.00
		0.46	-2.72*	0.58	0.00
		1.01	0.00	-10.18	0.00
	3	0.00	0.00	-10.18	0.00
		1.01	0.00	8.63	0.00
	4	0.00	0.00	8.63	0.00
		1.01	0.00	-3.95	0.00
Komb. 105	1	0.00	0.00	-16.42*	0.00
		0.47	4.90*	-0.34	0.00
		0.51	4.85	1.14	0.00
		0.92	1.16	13.20*	0.00
		1.01	0.00	11.74	0.00
	2	0.00	0.00	11.74	0.00
		0.46	-2.72*	0.58	0.00



		1.01	0.00	-10.18	0.00
	3	0.00	0.00	-10.18	0.00
		1.01	0.00	8.63	0.00
	4	0.00	0.00	8.63	0.00
		1.01	0.00	-3.95	0.00
Komb. 106	1	0.00	0.00	3.95	0.00
		0.51	-1.53	1.14	0.00
		1.01	0.00	-8.63	0.00
	2	0.00	0.00	-8.63	0.00
		1.01	0.00	10.18	0.00
	3	0.00	0.00	10.18	0.00
		0.55	-2.72*	-0.58	0.00
		1.01	0.00	-11.74	0.00
	4	0.00	0.00	-11.74	0.00
		0.09	1.16	-13.20*	0.00
		0.54	4.90*	0.34	0.00
		1.01	0.00	16.42*	0.00
Komb. 107	1	0.00	0.00	3.95	0.00
		0.51	-1.53	1.14	0.00
		1.01	0.00	-8.63	0.00
	2	0.00	0.00	-8.63	0.00
		1.01	0.00	10.18	0.00
	3	0.00	0.00	10.18	0.00
		0.55	-2.72*	-0.58	0.00
		1.01	0.00	-11.74	0.00
	4	0.00	0.00	-11.74	0.00
		0.09	1.16	-13.20*	0.00
		0.54	4.90*	0.34	0.00
		1.01	0.00	16.42*	0.00

Mat. /Querschnitt Material - und Querschnittswerte

Aluminium	Material	t _{Max} [mm]	f ₀ [N/mm ²]	E [N/mm ²]	BC
	<i>EN-AW 6063, T66, EP</i>	10 ^b	200	70000	A
		25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

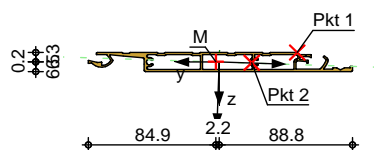
Querschnitt	QS Profil	A	S _y S _z [cm ³]	I _y I _z [cm ⁴]	W _y W _z [cm ³]
	1 <i>AVADI ELE13 H13mm</i>	6.0	1.4 12.7	1.5 141.6	2.3 16.0

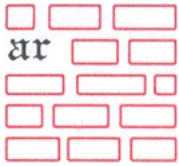
Hauptachsen	QS Profil	[°]	I _{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
	1 <i>AVADI ELE13 H13mm</i>	88.10	-4.7	141.8	1.4

Torsion	QS Profil	I _t [cm ⁴]	I [cm ⁶]
	1 <i>AVADI ELE13 H13mm</i>	3.7	0.0

Grafik Querschnittsgrafik [mm]

M 1:5





Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

	Aufl.	M _{x, k, min}	F _{Z, k, min}	F _{y, k, min}
		M _{x, k, max} [kNm]	F _{Z, k, max} [kN]	F _{y, k, max} [kN]
Ei nw. <i>Gk</i>	A	0.00	0.01	0.00
	B	0.00	0.01	0.00
	C	0.00	0.02	0.00
	D	0.00	0.02	0.00
	E	0.00	0.02	0.00
			0.00	0.01
Ei nw. <i>Qk. N</i>	A	0.00	-0.03	0.00
	B	0.00	0.26	0.00
	C	0.00	-0.05	0.00
	D	0.00	0.70	0.00
	E	0.00	-0.12	0.00
			0.00	0.66
Ei nw. <i>Qk. S</i>	A	0.00	-0.05	0.00
	B	0.00	0.70	0.00
	C	0.00	-0.03	0.00
	D	0.00	0.26	0.00
	E	0.00	0.04	0.00
			0.00	0.04

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E [-]
OK 0.45

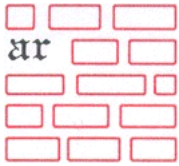
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung [-]
OK 0.97

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!



Pos. AL1-MI - Alu Bpr. (Mannlastansatz 1.0 kN)

Die Mannlast 1,0 kN wird auf 3 Dielen verteilt.

System **Einfeldträger**

M 1:50



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
1		0.75	0.0	frei

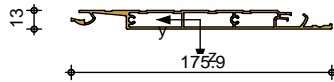
Feld	Material	Profil
1	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	$K_{T,z}$ [kN/m]	$K_{R,y}$ bzw.	$K_{T,y}$ [kNm/rad]	$K_{R,z}$	Gabel l. Wölbbeh.
A	0.00	fest	frei	fest	frei	fest	frei
B	0.75	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B	5.0

Grafik **Querschnittsgrafik**

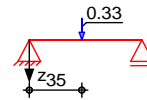
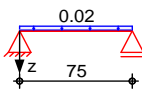
M 1:5



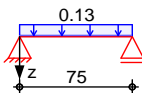
Belastungen **Belastungen auf das System**

Grafik **Belastungsgrafiken (einwirkungsbezogen)**

Einwirkungen **Gk**



Qk. S

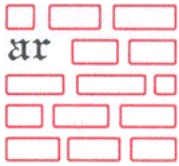


Streckenlasten **in z-Richtung**

Gleichlasten **Feld Komm.**

Einw. **Gk**
 Einw. **Qk. S**

Feld	Komm.	a [m]	s [m]	q_{li} [kN/m]	q_{re} [kN/m]	e [cm]
1	Eigengew	0.00	0.75		0.02	-0.2
1	s	0.00	0.75		0.13	0.0



Punktlasten
in z-Richtung

Einzellasten
Feld Komm.

a
[m]

F_z
[kN]

e
[cm]

Ei nw. Qk. N

1 MI

0.35

0.33

0.0

Char. Schnittgrößen

charakteristische Schnittgrößen und Verformungen

Grafik

Schnittgrößen und Verformungen (je Einwirkung)

Ei nw. Gk

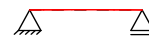
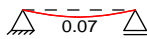
Moment M_{y,k} [kNm]

Querkraft V_{z,k} [kN]

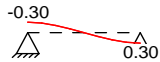


Verschiebung w_{z,k} [mm]

Verdrehung φ_{x,k} [mrad]



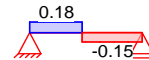
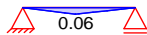
Verdrehung φ_{y,k} [mrad]



Ei nw. Qk. N

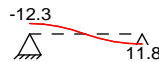
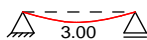
Moment M_{y,k} [kNm]

Querkraft V_{z,k} [kN]



Verschiebung w_{z,k} [mm]

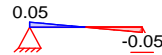
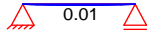
Verdrehung φ_{y,k} [mrad]



Ei nw. Qk. S

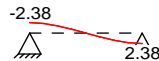
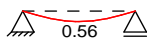
Moment M_{y,k} [kNm]

Querkraft V_{z,k} [kN]



Verschiebung w_{z,k} [mm]

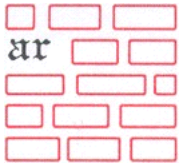
Verdrehung φ_{y,k} [mrad]



Tabelle

Schnittgrößen (je Einwirkung)

	Feld	x [m]	M _{y,k,min} [kNm]	M _{y,k,max} [kNm]	V _{z,k,min} [kN]	V _{z,k,max} [kN]
Ei nw. Gk	1	0.00	0.00	0.00	0.01	0.01*
		0.38	0.00	0.00	0.00	0.00
		0.75	0.00	0.00	-0.01*	-0.01
Ei nw. Qk. N	1	0.00	0.00	0.00	0.18	0.18*
		0.35	0.06	0.06*	0.18	0.18
		0.35	0.06	0.06	-0.15*	-0.15
		0.75	0.00	0.00	-0.15	-0.15
Ei nw. Qk. S	1	0.00	0.00	0.00	0.05	0.05*
		0.38	0.01	0.01*	0.00	0.00
		0.75	0.00	0.00	-0.05*	-0.05



Verformungen (je Einwirkung)

	Feld	x [m]	Wz, k, min	y, k, min	x, k, min
			Wz, k, max	y, k, max	x, k, max
			[mm]	[mrad]	[mrad]
Einw. Gk	1	0.00	0.00	-0.30*	0.00
			0.00	-0.30	0.00
		0.38	0.07*	0.00	0.00
		0.75	0.00	0.30	0.00
Einw. Qk. N	1	0.00	0.00	-12.29*	0.00
			0.00	-12.29	0.00
		0.37	3.00	-0.01	0.00
		0.75	0.00	11.75	0.00
Einw. Qk. S	1	0.00	0.00	-2.38*	0.00
			0.00	-2.38	0.00
		0.38	0.56	0.00	0.00
		0.75	0.00	2.38	0.00

Kombinationen

Kombinationsbildung nach DIN EN 1990
Darstellung der maßgebenden Kombinationen

	Ek	(* *EW)
ständig/vorüberg.	5	1.35*Gk +1.50*Qk. N +1.50*Qk. S
quasi-ständig	12	1.00*Gk +0.80*Qk. N

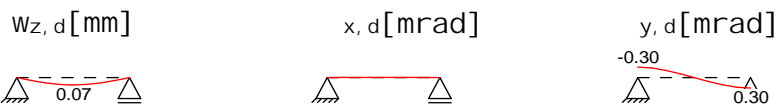
Bem.-verformungen

Bemessungsverformungen

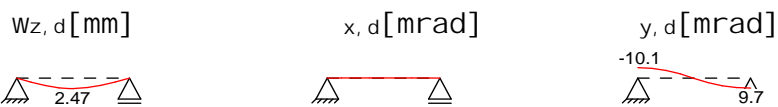
Grafik

Verformungen (je Kombination)

Komb. 11



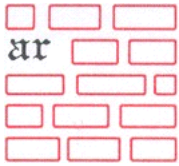
Komb. 12



Tabelle

Verformungen (je Kombination)

	Feld	x [m]	Wz, d	y, d	x, d
			[mm]	[mrad]	[mrad]
Komb. 11	1	0.00	0.00	-0.30*	0.00
		0.38	0.07*	0.00	0.00
		0.75	0.00	0.30*	0.00
Komb. 12	1	0.00	0.00	-10.13*	0.00
		0.37	2.47*	-0.02	0.00
		0.38	2.47	0.39	0.00
		0.75	0.00	9.70*	0.00



Mat./Querschnitt Material - und Querschnittswerte

Material	t_{Max} [mm]	f_o [N/mm ²]	E [N/mm ²]	BC
EN-AW 6063, T66, EP	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

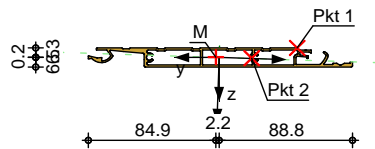
QS Profil	A	S_y S_z [cm ³]	I_y I_z [cm ⁴]	W_y W_z [cm ³]
1 AVADI ELE13 H13mm	6.0	1.4 12.7	1.5 141.6	2.3 16.0

QS Profil	[°]	I_{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1 AVADI ELE13 H13mm	88.10	-4.7	141.8	1.4

QS Profil	I_t [cm ⁴]	I [cm ⁶]
1 AVADI ELE13 H13mm	3.7	0.0

Grafik Querschnittsgrafik [mm]

M 1:5



Auflagerkräfte Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

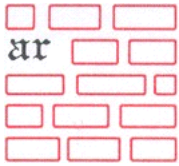
Aufl.	$M_{x, k, min}$ $M_{x, k, max}$ [kNm]	$F_{z, k, min}$ $F_{z, k, max}$ [kN]	$F_{y, k, min}$ $F_{y, k, max}$ [kN]
Ei nw. Gk	A	0.00	0.01
	B	0.00	0.01
	A	0.00	0.18
	B	0.00	0.15
Ei nw. Qk. N	A	0.00	0.05
	B	0.00	0.05
	A	0.00	0.05
	B	0.00	0.05

Zusammenfassung Zusammenfassung der Nachweise

Nachweise (GZT) Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E	OK	0.39
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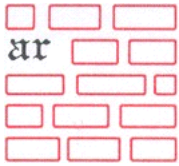
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung OK $\frac{[-]}{0.99}$

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!

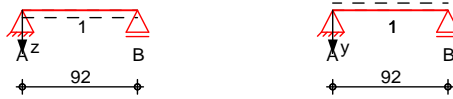


Pos. AL1-MI - 200 Al u Bpr. (Mannlastansatz 1.0 kN/m)

Die Mannlast 1,0 kN wird auf 3 Dielen verteilt.

System Einfeldträger

M 1: 60



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1	0.92	0.0	frei

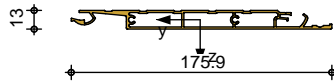
Feld	Material	Profil
1	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	$K_{T,z}$ [kN/m]	$K_{R,y}$ bzw.	$K_{T,y}$ [kNm/rad]	$K_{R,z}$	Gabel l. Wölbbeh.	
	A	0.00	fest	frei	fest	frei	fest	frei
	B	0.92	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B	5.0

Grafik Querschnittsgrafik

M 1: 5



Belastungen Belastungen auf das System

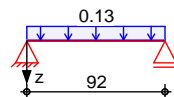
Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen

Gk Qk. N



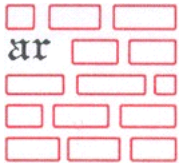
Qk. S



Streckenlasten in z-Richtung

Gleichlasten
Feld Komm.

	Feld	Komm.	a [m]	s [m]	q_{li} [kN/m]	q_{re} [kN/m]	e [cm]
Einw. Gk	1	Eigengew	0.00	0.92		0.02	-0.2
Einw. Qk. S	1	s	0.00	0.92		0.13	0.0



Punktlasten
in z-Richtung

Einzellasten
Feld Komm.

a
[m]

F_z
[kN]

e
[cm]

Einw. Qk, N

1 MI

0.46

0.33

0.0

Char. Schnittgrößen

charakteristische Schnittgrößen und Verformungen

Grafik

Schnittgrößen und Verformungen (je Einwirkung)

Einw. Gk

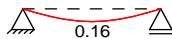
Moment M_{y, k} [kNm]

Querkraft V_{z, k} [kN]

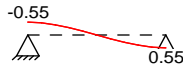


Verschiebung w_{z, k} [mm]

Verdrehung φ_{x, k} [mrad]



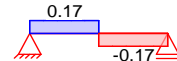
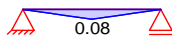
Verdrehung φ_{y, k} [mrad]



Einw. Qk, N

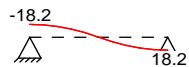
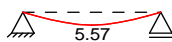
Moment M_{y, k} [kNm]

Querkraft V_{z, k} [kN]



Verschiebung w_{z, k} [mm]

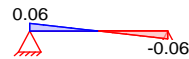
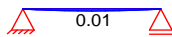
Verdrehung φ_{y, k} [mrad]



Einw. Qk, S

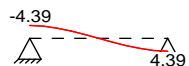
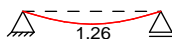
Moment M_{y, k} [kNm]

Querkraft V_{z, k} [kN]



Verschiebung w_{z, k} [mm]

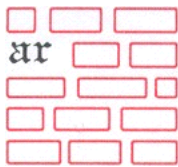
Verdrehung φ_{y, k} [mrad]



Tabelle

Schnittgrößen (je Einwirkung)

Einw.	Feld	x [m]	M _{y, k, min} [kNm]	M _{y, k, max} [kNm]	V _{z, k, min} [kN]	V _{z, k, max} [kN]
Gk	1	0.00	0.00	0.00	0.01	0.01*
		0.46	0.00	0.00	0.00	0.00
		0.92	0.00	0.00	-0.01*	-0.01
Qk, N	1	0.00	0.00	0.00	0.17	0.17*
		0.46	0.08	0.08*	0.17	0.17
		0.46	0.08	0.08	-0.17*	-0.17
		0.92	0.00	0.00	-0.17	-0.17
Qk, S	1	0.00	0.00	0.00	0.06	0.06*
		0.46	0.01	0.01*	0.00	0.00
		0.92	0.00	0.00	-0.06*	-0.06



Verformungen (je Einwirkung)

	Feld	x [m]	Wz, k, min	y, k, min	x, k, min
			Wz, k, max [mm]	y, k, max [mrad]	x, k, max [mrad]
Einw. Gk	1	0.00	0.00	-0.55*	0.00
		0.46	0.16	0.00	0.00
		0.92	0.16*	0.00	0.00
Einw. Qk. N	1	0.00	0.00	-18.17*	0.00
		0.46	5.57	0.00	0.00
		0.92	5.57*	0.00	0.00
		0.92	0.00	18.17	0.00
Einw. Qk. S	1	0.00	0.00	-4.39*	0.00
		0.46	1.26	0.00	0.00
		0.92	1.26*	0.00	0.00
		0.92	0.00	4.39	0.00

Kombinationen

Kombinationsbildung nach DIN EN 1990
 Darstellung der maßgebenden Kombinationen

	Ek	(* *EW)
ständig/vorüberg.	5	1.35*Gk +1.50*Qk. N +1.50*Qk. S
quasi-ständig	12	1.00*Gk +0.80*Qk. N

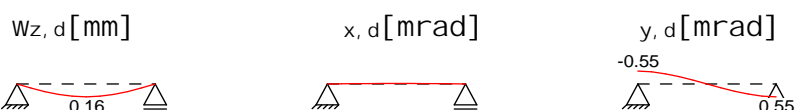
Bem.-verformungen

Bemessungsverformungen

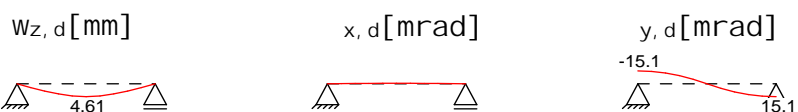
Grafik

Verformungen (je Kombination)

Komb. 11



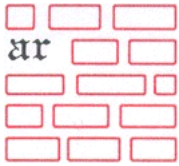
Komb. 12



Tabelle

Verformungen (je Kombination)

	Feld	x [m]	Wz, d	y, d	x, d
			[mm]	[mrad]	[mrad]
Komb. 11	1	0.00	0.00	-0.55*	0.00
		0.46	0.16*	0.00	0.00
		0.92	0.00	0.55*	0.00
Komb. 12	1	0.00	0.00	-15.08*	0.00
		0.46	4.61*	0.00	0.00
		0.92	0.00	15.08*	0.00



Mat. / Querschnitt

Material - und Querschnittswerte

Aluminium

Material

t_{Max} [mm]	f_o [N/mm ²]	E [N/mm ²]	BC
10 ^b	200	70000	A
25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

QS Profil A

	S_y S_z [cm ³]	I_y I_z [cm ⁴]	W_y W_z [cm ³]
1 AVADI ELE13 H13mm	6.0	1.4 12.7	1.5 141.6
			2.3 16.0

Hauptachsen

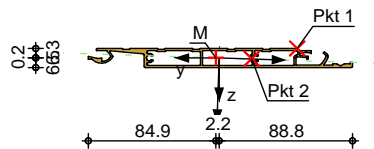
QS Profil

	I_{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1 AVADI ELE13 H13mm	88.10	-4.7	141.8
			1.4

Grafik

Querschnittsgrafik [mm]

M 1:5



Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

Aufl.	$M_{x,k}$ [kNm]	$F_{z,k}$ [kN]	$F_{y,k}$ [kN]
Ei nw. Gk	A 0.00	0.01	0.00
	B 0.00	0.01	0.00
Ei nw. Qk. N	A 0.00	0.17	0.00
	B 0.00	0.17	0.00
Ei nw. Qk. S	A 0.00	0.06	0.00
	B 0.00	0.06	0.00

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E	OK	0.50
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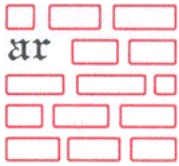
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung	OK	1.00
------------	----	------

Die Auflager Spannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!

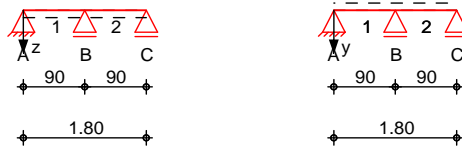


Pos. AL1-MI -2-Feld Alu Bpr. (Mannlastansatz 1.0 kN/m)

Die Mannlast 1,0 kN wird auf 3 Dielen verteilt.

System Durchlaufträger

M 1:110



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1-2	0.90	0.0	frei

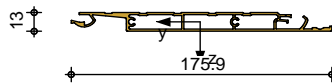
Feld	Material	Profil
1-2	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	$K_{T,z}$ [kN/m]	$K_{R,y}$ bzw.	$K_{T,y}$ [kNm/rad]	$K_{R,z}$	Gabel l. Wölbbeh.	
	A	0.00	fest	frei	fest	frei	fest	frei
	B	0.90	fest	frei	fest	frei	fest	frei
	C	1.80	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B, C	5.0

Grafik Querschnittsgrafik

M 1:5

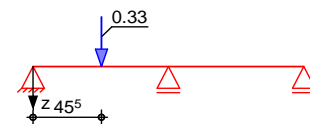
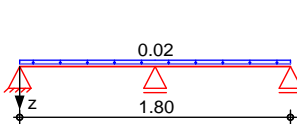


Belastungen Belastungen auf das System

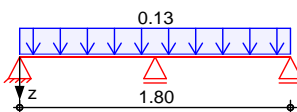
Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen

Gk Qk.N



Qk.S



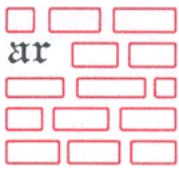
Streckenlasten
in z-Richtung

Gleichlasten
Feld Komm.

Einw. Gk

Einw. Qk.S

		a [m]	s [m]	q_{li} [kN/m]	q_{re} [kN/m]	e [cm]
1	Eiengew	0.00	0.90	0.02	-0.2	
2	Eiengew	0.00	0.90	0.02	-0.2	
1	s	0.00	1.80	0.13	0.0	



Punktlasten
in z-Richtung

Einzellasten
Feld Komm.

a
[m]

F_z
[kN]

e
[cm]

Ei nw. Qk. N

1 MI 0.46

0.33 0.0

Char. Schnittgrößen

charakteristische Schnittgrößen und Verformungen

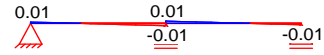
Grafik

Schnittgrößen und Verformungen (je Einwirkung)

Ei nw. Gk

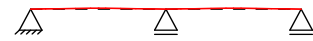
Moment M_{y, k} [kNm]

Querkraft V_{z, k} [kN]

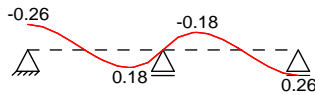


Verschiebung w_{z, k} [mm]

Verdrehung x_k [mrad]



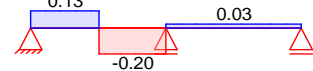
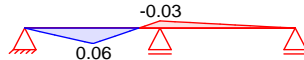
Verdrehung y_k [mrad]



Ei nw. Qk. N

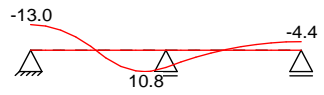
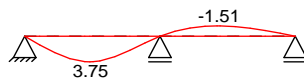
Moment M_{y, k} [kNm]

Querkraft V_{z, k} [kN]



Verschiebung w_{z, k} [mm]

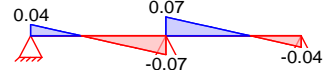
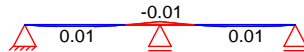
Verdrehung y_k [mrad]



Ei nw. Qk. S

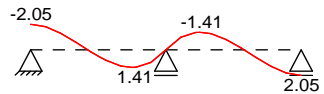
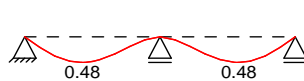
Moment M_{y, k} [kNm]

Querkraft V_{z, k} [kN]



Verschiebung w_{z, k} [mm]

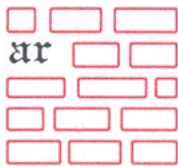
Verdrehung y_k [mrad]



Tabelle

Schnittgrößen (je Einwirkung)

	Feld	x [m]	M _{y, k, min} [kNm]	M _{y, k, max} [kNm]	V _{z, k, min} [kN]	V _{z, k, max} [kN]
Ei nw. Gk	1	0.00	0.00	0.00	0.01	0.01
		0.34	0.00	0.00	0.00	0.00
		0.90	0.00	0.00	-0.01*	-0.01
Ei nw. Qk. N	2	0.00	0.00	0.00	0.01	0.01*
		0.90	0.00	0.00	-0.01	-0.01
		0.90	0.00	0.00	-0.01	-0.01
Ei nw. Qk. N	1	0.00	0.00	0.00	0.00	0.13*
		0.46	0.00	0.06*	0.00	0.13
		0.46	0.00	0.06	-0.20*	0.00
		0.90	-0.03*	0.00	-0.20	0.00
		0.90	-0.03	0.00	0.00	0.00
Ei nw. Qk. S	1	0.00	0.00	0.00	0.04	0.04



	0.34	0.01	0.01*	0.00	0.00
	0.90	-0.01*	-0.01	-0.07*	-0.07
2	0.00	-0.01	-0.01	0.07	0.07*
	0.90	0.00	0.00	-0.04	-0.04

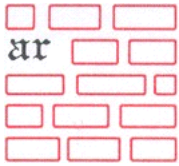
Verformungen (je Einwirkung)

Einw.	Gk	Feld	x [m]	Wz, k, min	y, k, min	x, k, min
				Wz, k, max	y, k, max	x, k, max
			[m]	[mm]	[mrad]	[mrad]
Einw. Gk	1	1	0.00	0.00	-0.26*	0.00
			0.45	0.06	0.06	0.00
			0.90	0.00	0.00	0.00
			0.00	0.00	0.00	0.00
	2	1	0.00	0.00	0.00	0.00
			0.52	0.06	0.00	0.00
			0.90	0.06*	0.00	0.00
			0.00	0.00	0.26	0.00
Einw. Qk. N	1	1	0.00	0.00	-12.96*	0.00
			0.43	0.00	0.00	0.00
			0.76	3.75*	0.05	0.00
			0.90	1.42	10.78*	0.00
	2	1	0.00	0.00	8.72	0.00
			0.38	0.00	8.72	0.00
			0.90	-1.51*	0.00	0.00
			0.00	0.00	0.03	0.00
Einw. Qk. S	1	1	0.00	0.00	-2.05*	0.00
			0.90	0.00	-2.05	0.00
			0.00	0.00	0.00	0.00
			0.52	0.00	0.00	0.00
	2	1	0.00	0.00	0.00	0.00
			0.52	0.48	0.00	0.00
			0.90	0.48*	0.00	0.00
			0.00	0.00	2.05	0.00
				2.05*	0.00	

Kombinationen

Kombinationsbildung nach DIN EN 1990
Darstellung der maßgebenden Kombinationen

	Ek	(* *EW)		
ständig/vorüberg.	6	1.35*Gk	+1.50*Qk. N (1)	+1.50*Qk. S
quasi-ständig	14	1.00*Gk	+0.80*Qk. N (1)	



Bem. -verformungen

Bemessungsverformungen

Grafik

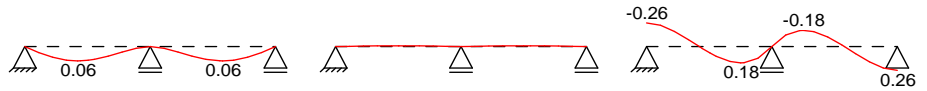
Verformungen (je Kombination)

Komb. 13

Wz, d [mm]

x, d [mrad]

y, d [mrad]

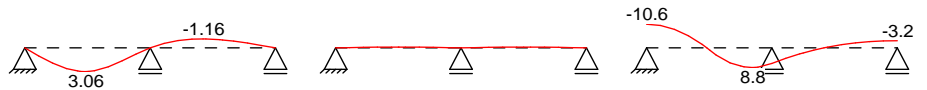


Komb. 14

Wz, d [mm]

x, d [mrad]

y, d [mrad]

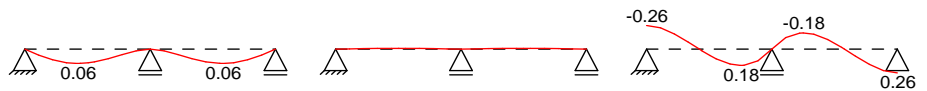


Komb. 15

Wz, d [mm]

x, d [mrad]

y, d [mrad]



Tabelle

Verformungen (je Kombination)

Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]	
Komb. 13	1	0.00	-0.26*	0.00	
		0.45	0.06	0.06	0.00
		0.90	0.00	0.00	0.00
Komb. 14	1	0.00	-10.62*	0.00	
		0.43	3.06*	0.09	0.00
		0.45	3.05	0.85	0.00
Komb. 15	1	0.00	-0.26*	0.00	
		0.45	0.06	0.06	0.00
		0.90	0.00	0.00	0.00

Mat. /Querschnitt

Material - und Querschnittswerte

Aluminium

Material

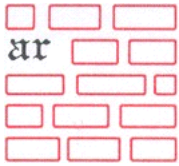
	t _{Max} [mm]	f _o [N/mm ²]	E [N/mm ²]	BC
EN-AW 6063, T66, EP	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

QS Profil

	A [cm ²]	S _y [cm ³]	I _y [cm ⁴]	W _y [cm ³]
1 AVADIELE13 H13mm	6.0	1.4	1.5	2.3
		12.7	141.6	16.0



Hauptachsen

QS	Profil	$[\text{°}]$	I_{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1	AVADI ELE13 H13mm	88.10	-4.7	141.8	1.4

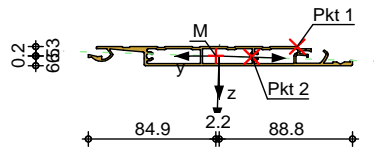
Torsion

QS	Profil	I_t [cm ⁴]	I [cm ⁶]
1	AVADI ELE13 H13mm	3.7	0.0

Grafik

Querschnittsgrafik [mm]

M 1:5



Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

	Aufl.	$M_{x, k, \min}$	$M_{x, k, \max}$	$F_{z, k, \min}$	$F_{z, k, \max}$	$F_{y, k, \min}$	$F_{y, k, \max}$	
		[kNm]		[kN]		[kN]		
Ei nw. Gk	A	0.00	0.00	0.01	0.01	0.00	0.00	
	B	0.00	0.00	0.02	0.02	0.00	0.00	
	C	0.00	0.00	0.01	0.01	0.00	0.00	
Ei nw. Qk. N	A	0.00	0.00	0.00	0.13	0.00	0.00	
	B	0.00	0.00	0.00	0.23	0.00	0.00	
	C	0.00	0.00	-0.03	0.00	0.00	0.00	
Ei nw. Qk. S	A	0.00	0.00	0.04	0.04	0.00	0.00	
	B	0.00	0.00	0.15	0.15	0.00	0.00	
	C	0.00	0.00	0.04	0.04	0.00	0.00	

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E	OK	0.37
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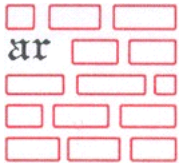
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung	OK	1.02
------------	----	------

Die Auflager Spannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!

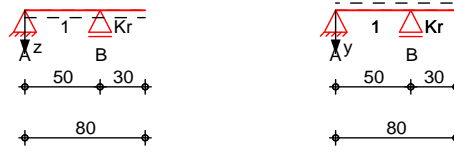


Pos. AL2-MI Alu Bpr Kragarm (ML, 1.0 kN)

Die Mannlast 1,0 kN wird auf 3 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:50



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1	0.50	0.0	frei
	Kr	0.30	0.0	frei

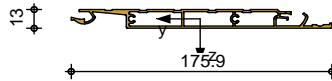
Feld	Material	Profil
1-Kr	EN-AW 6063, T66, EP	AVADIELE13 H13mm

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _R	Gabel I.	Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest	frei
	B	0.50	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B	5.0

Grafik Querschnittsgrafik

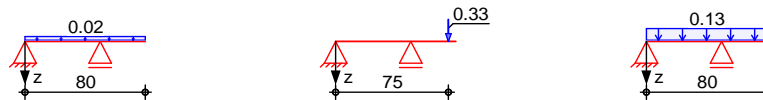
M 1:5



Belastungen Belastungen auf das System

Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen Gk Qk. N-1 Qk. S



Streckenlasten in z-Richtung

Einw. Gk

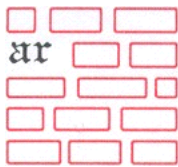
Einw. Qk. S

Gleichlasten		a	s	Q _{li}	Q _{re}	e
Feld	Komm.	[m]	[m]	[kN/m]	[kN/m]	[cm]
1	Einweg	0.00	0.50		0.02	-0.2
Kr	Einweg	0.00	0.30		0.02	-0.2
1	p+s	0.00	0.80		0.13	0.0

Punktlasten in z-Richtung

Einw. Qk. N-1

Einzellasten		a	F _z	e
Feld	Komm.	[m]	[kN]	[cm]
Kr	MI	0.25	0.33	0.0



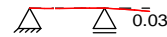
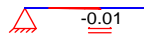
Char. Schnit tgrößen charakteristische Schnit tgrößen und Verformungen

Grafi k Schnit tgrößen und Verformungen (je Ei nwi rkung)

Ei nw. *Gk*

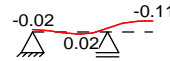
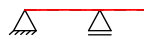
Querkraft $V_{z,k}$ [kN]

Verschi ebung $w_{z,k}$ [mm]



Verdrehung $\alpha_{x,k}$ [mrad]

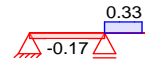
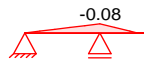
Verdrehung $\alpha_{y,k}$ [mrad]



Ei nw. *Qk. N-1*

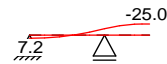
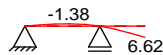
Moment $M_{y,k}$ [kNm]

Querkraft $V_{z,k}$ [kN]



Verschi ebung $w_{z,k}$ [mm]

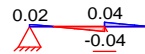
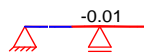
Verdrehung $\alpha_{y,k}$ [mrad]



Ei nw. *Qk. S*

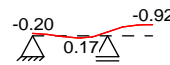
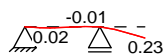
Moment $M_{y,k}$ [kNm]

Querkraft $V_{z,k}$ [kN]



Verschi ebung $w_{z,k}$ [mm]

Verdrehung $\alpha_{y,k}$ [mrad]



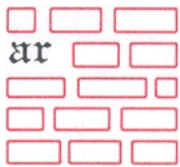
Tabel l e

Schnit tgrößen (je Ei nwi rkung)

	Fel d	x [m]	$M_{y,k, \min}$ [kNm]	$M_{y,k, \max}$ [kNm]	$V_{z,k, \min}$ [kN]	$V_{z,k, \max}$ [kN]
Ei nw. <i>Gk</i>	1	0.00	0.00	0.00	0.00	0.00
		0.50	0.00	0.00	-0.01*	-0.01
	Kr	0.00	0.00	0.00	0.00	0.00
Ei nw. <i>Qk. N-1</i>	1	0.00	0.00	0.00	-0.17*	0.00
		0.50	-0.08*	0.00	-0.17	0.00
	Kr	0.00	-0.08	0.00	0.00	0.33*
Ei nw. <i>Qk. S</i>	1	0.00	0.00	0.00	0.02	0.02
		0.16	0.00	0.00	0.00	0.00
	Kr	0.50	-0.01*	-0.01	-0.04*	-0.04
		0.30	0.00	0.00	0.00	0.00

Verformungen (je Ei nwi rkung)

	Fel d	x [m]	$w_{z,k, \min}$ [mm]	$\alpha_{y,k, \min}$ [mrad]	$\alpha_{x,k, \min}$ [mrad]	
Ei nw. <i>Gk</i>	1	0.00	0.00	-0.02	0.00	
			0.00	0.00	-0.02	0.00
		0.32	0.00	0.02	0.02*	0.00
			0.00	0.00	0.01	0.00
		0.50	0.00	-0.04	0.00	0.00



			0.00	-0.04	0.00
	Kr	0.00	0.00	-0.04	0.00
			0.00	-0.04	0.00
		0.30	0.03	-0.11*	0.00
			0.03*	-0.11	0.00
Ei nw. Qk. N-1	1	0.00	0.00	0.00	0.00
			0.00	7.15*	0.00
		0.29	-1.38*	-0.09	0.00
			0.00	0.00	0.00
		0.50	0.00	-14.31	0.00
			0.00	0.00	0.00
	Kr	0.00	0.00	-14.31	0.00
			0.00	0.00	0.00
		0.25	0.00	-25.04*	0.00
			5.37	0.00	0.00
		0.30	0.00	-25.04	0.00
			6.62*	0.00	0.00
Ei nw. Qk. S	1	0.00	0.00	-0.20	0.00
			0.00	-0.20	0.00
		0.32	0.00	0.17	0.00
			0.00	0.17*	0.00
		0.40	-0.01*	0.09	0.00
			-0.01	0.09	0.00
		0.50	0.00	-0.31	0.00
			0.00	-0.31	0.00
	Kr	0.00	0.00	-0.31	0.00
			0.00	-0.31	0.00
		0.30	0.23	-0.92*	0.00
			0.23*	-0.92	0.00

Kombi nati onen

Kombi nati onsbi ldu ng nach DIN EN 1990
 Darstel lung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	36	1	1.35*Gk	+1.50*Qk. S	
	42	3	1.35*Gk	+1.50*Qk. N-1	+0.75*Qk. S
				(2)	
	43	4	1.35*Gk	+1.50*Qk. N-1	+0.75*Qk. S
				(2)	
quasi -ständi g	17		1.00*Gk	+0.30*Qk. N-1	
				(2)	

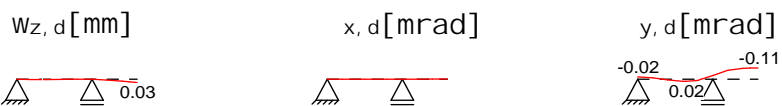
Bem. -verformungen

Bemessungsverformungen

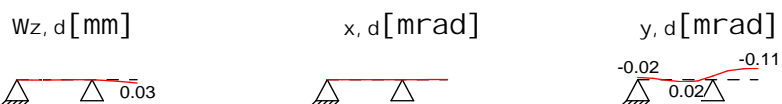
Grafi k

Verformungen (j e Kombi nati on)

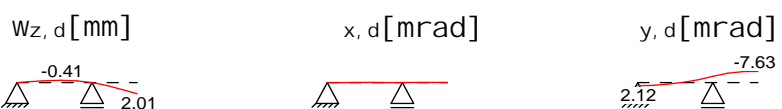
Komb. 15

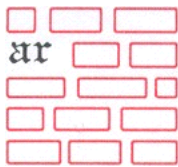


Komb. 16



Komb. 17



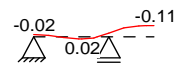
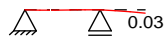


Komb. 58

Wz, d [mm]

x, d [mrad]

y, d [mrad]

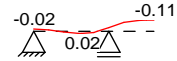
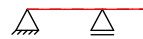
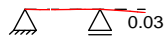


Komb. 59

Wz, d [mm]

x, d [mrad]

y, d [mrad]

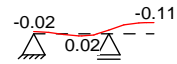
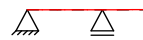
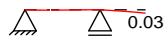


Komb. 60

Wz, d [mm]

x, d [mrad]

y, d [mrad]

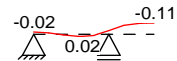
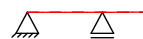
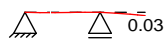


Komb. 61

Wz, d [mm]

x, d [mrad]

y, d [mrad]

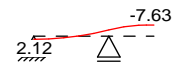
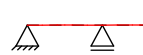
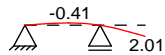


Komb. 62

Wz, d [mm]

x, d [mrad]

y, d [mrad]

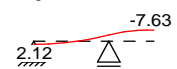
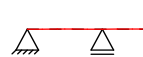
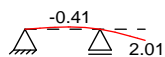


Komb. 63

Wz, d [mm]

x, d [mrad]

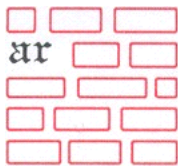
y, d [mrad]



Tabelle

Verformungen (je Kombination)

	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 15	1	0.00	0.00	-0.02	0.00
		0.32	0.00	0.02*	0.00
		0.40	0.00	0.01	0.00
		0.50	0.00	-0.04	0.00
	Kr	0.00	0.00	-0.04	0.00
Komb. 16	1	0.00	0.00	-0.02	0.00
		0.32	0.00	0.02*	0.00
		0.40	0.00	0.01	0.00
		0.50	0.00	-0.04	0.00
	Kr	0.00	0.00	-0.04	0.00
Komb. 17	1	0.00	0.00	2.12*	0.00
		0.29	-0.41*	-0.01	0.00
		0.50	0.00	-4.33	0.00
		0.00	0.00	-4.33	0.00
	Kr	0.30	2.01*	-7.63*	0.00
Komb. 58	1	0.00	0.00	-0.02	0.00
		0.32	0.00	0.02*	0.00
		0.40	0.00	0.01	0.00
		0.50	0.00	-0.04	0.00
	Kr	0.00	0.00	-0.04	0.00
Komb. 59	1	0.00	0.00	-0.02	0.00
		0.32	0.00	0.02*	0.00
		0.40	0.00	0.01	0.00
		0.50	0.00	-0.04	0.00
	Kr	0.00	0.00	-0.04	0.00
Komb. 60	1	0.00	0.00	-0.02	0.00
		0.32	0.00	0.02*	0.00
		0.40	0.00	0.01	0.00
		0.50	0.00	-0.04	0.00
	Kr	0.00	0.00	-0.04	0.00



		0.40	0.00	0.01	0.00
		0.50	0.00	-0.04	0.00
	Kr	0.00	0.00	-0.04	0.00
		0.30	0.03*	-0.11*	0.00
Komb. 61	1	0.00	0.00	-0.02	0.00
		0.32	0.00	0.02*	0.00
		0.40	0.00	0.01	0.00
	Kr	0.50	0.00	-0.04	0.00
		0.00	0.00	-0.04	0.00
		0.30	0.03*	-0.11*	0.00
Komb. 62	1	0.00	0.00	2.12*	0.00
		0.29	-0.41*	-0.01	0.00
		0.50	0.00	-4.33	0.00
	Kr	0.00	0.00	-4.33	0.00
		0.30	2.01*	-7.63*	0.00
Komb. 63	1	0.00	0.00	2.12*	0.00
		0.29	-0.41*	-0.01	0.00
		0.50	0.00	-4.33	0.00
	Kr	0.00	0.00	-4.33	0.00
		0.30	2.01*	-7.63*	0.00

Mat. / Querschnitt Material - und Querschnittswerte

Aluminium	Material	t_{Max} [mm]	f_o [N/mm ²]	E [N/mm ²]	BC
	<i>EN-AW 6063, T66, EP</i>	10 ^b	200	70000	A
		25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

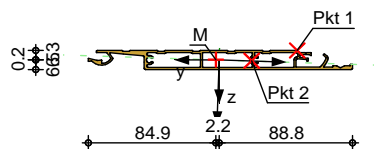
Querschnitt	QS Profil	A	S_y S_z [cm ³]	I_y I_z [cm ⁴]	W_y W_z [cm ³]
	1 <i>AVADI ELE13 H13mm</i>	6.0	1.4 12.7	1.5 141.6	2.3 16.0

Hauptachsen	QS Profil	[°]	I_{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
	1 <i>AVADI ELE13 H13mm</i>	88.10	-4.7	141.8	1.4

Torsion	QS Profil	I_t [cm ⁴]	I [cm ⁶]
	1 <i>AVADI ELE13 H13mm</i>	3.7	0.0

Grafik Querschnittsgrafik [mm]

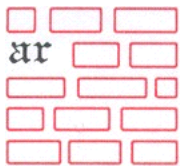
M 1:5



Auflagerkräfte Charakteristische Auflagerkräfte (gl obal)

Char. Auflagerkr.

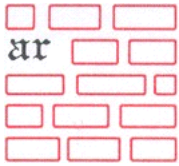
Aufl.	$M_{x, k, min}$ $M_{x, k, max}$ [kNm]	$F_{z, k, min}$ $F_{z, k, max}$ [kN]	$F_{y, k, min}$ $F_{y, k, max}$ [kN]
Ei nw. GK	A 0.00 0.00	0.00 0.00	0.00 0.00
	B 0.00 0.00	0.01 0.01	0.00 0.00



Ei nw. Qk. N-1	A	0.00	-0.16	0.00
		0.00	0.00	0.00
	B	0.00	0.00	0.00
		0.00	0.49	0.00
Ei nw. Qk. S	A	0.00	0.02	0.00
		0.00	0.02	0.00
	B	0.00	0.08	0.00
		0.00	0.08	0.00

Zusammenfassung	Zusammenfassung der Nachwei se			
Nachwei se (GZT)	Nachwei se im Grenzzustand der Tragfähi gkei t			
	Nachwei s			
	Nachwei s E-E		OK	$\frac{[-]}{0.47}$
Nachwei se (GZG)	Nachwei se im Grenzzust. der Gebrauchstaugli chkei t			
	Nachwei s			
	Verformung		OK	$\frac{[-]}{1.01}$

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
 Kürzere Spannweiten sind möglich!



PROJEKT **19259-1Aludiele 2019 AVA**
POSITION **ALSchT_01 Schlusstext**

SEITE **87**
PROJ.-NR. **19259_1**
DATUM **19.03.2019**

Pos. ALSchT_01 Schlusstext

Die in der Berechnung betrachteten Stützweiten sind Grenzstützweiten!
Kürzere Stützweiten sind ohne weitere Nachweise möglich!

Weitere Stützweiten sind in gesonderten Nachweisen zu überprüfen!

Zur Verankerung des Belags sind die einschlägigen Richtlinien zu beachten, insbesondere für Windlasten (Sog; Druck)!

Rheinfelden,

März 2019,

Aufgestellt:

